IRON AGE

DECEMBER 13, 1951
VOL. 168, No. 24

THE IRON AGE
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DIGEST

of the week in metalworking

PAGE 87 **CRANE SHORTAGE CUTS STEEL PRODUCTION**

Steel industry expansion has been hurt by shortages of mill cranes. Ingot output has been lost and it's too late to avert further losses. Work on some cranes has stopped because of materials shortages. Cranemakers are expecting aid on allocations. Meanwhile one mill may lose much steel output.

PAGE 88 **NEW KAISER ALUMINUM PLANT OPENS IN LA.**

Chalmette plant at New Orleans will be the largest primary aluminum producer in the U. S. when finished. An estimated 200,000 tons yearly will come from eight potlines. Natural gas is used as the power source for the electrolytic cells. Jamaican ore will be processed at Baton Rouge.

PAGE 90 **STEEL UNION TALKS WITHOUT FANFARE?**

If preliminaries to wage negotiation in the steel industry could be swept aside, the wage problem might be solved in short order. But there is little chance of this happening. Management and labor are poles apart. The union wants everything it can get and steel must have price rises.

PAGE 93 **LOCAL SUBCONTRACTING PLAN GETS RESULTS**

Some $6 million worth of contracts have been awarded as a result of a recent small business program held by NPA and the Armed Forces Regional Council at Scranton and Wilkes-Barre. NPA field offices furnished the dope on what small business had to offer. Prime contractors did the rest.

PAGE 95 **WAREHOUSES BUSY SETTING NEW PRICES**

The country's steel warehouses were this week burning midnight oil in computing new ceiling prices demanded by CPR 98. Price lists of most warehouses should be out to customers before the week is out. Some items such as structurals, bars, sheets may drop, but others will rise modestly.

PAGE 105 **DPA SLICES THE STEEL PRODUCTION PIE**

Military production will get 20 pct of the nation's steel in the first quarter, ruled DPA. Defense-supporting industries will get 22 pct while civilian output will be given 58 pct. DPA officials are quietly examining charges of faulty distribution which may have caused a lag in military output.

PAGE 117 **MAKE AMERICAN MACHINE TOOLS IN EUROPE?**

Midwestern industrialists are reported negotiating to have U. S. machine tools made in Germany and France. The group hopes to persuade American tool builders to release their designs for manufacture abroad. Opportunities for subcontracting here would of course be greatly reduced.

PAGE 127 **WHAT ARE ELECTRIC FURNACE SIZE LIMITS?**

Barring unforeseen electric developments, arc furnaces will probably be built in sizes smaller than 150-ton units. Furnaces will be better but physical and electrical factors will limit size. When current through transformer, busses, and electrodes goes up, losses will tend to become much greater.

PAGE 132 **DIAPHRAGM PLATING PROVED IN PRODUCTION**

By directing plating solution flow from the cathode through a fabric diaphragm to the work being plated, surface pits, bumps and polarization are minimized. Experience shows that circulation of solution and filtration are improved. Higher current densities may be used and costs are reduced.

PAGE 134 **MACHINE SEAMWELDS FRONT FENDERS FASTER**

Buick front fenders are seamwelded on an ingenious new machine which combines the advantages of a fender bender and seam welder. Production rate is 180 fenders per hr. Heating operation for forming around headlight area has been eliminated. Savings in handling and finishing result.

PAGE 185 **STEEL SPOTLIGHT TURNING ON INVENTORIES**

Steel officials are convinced that demand for cold-rolled sheets is slipping. They are concerned over inventories of some consumers, which they feel are reaching allowable limits. What they'd like to know is how much this results from government production restrictions. Consumers don't want to say.

NEXT WEEK **ALLOYS ARE FLASH WELDED AUTOMATICALLY**

Preset machines flash-butt weld aircraft landing gear tubing. Materials are 4130, 4140, 4340, and similar steel. Quality control test specimens show as low as 2.1 pct failure. Areas of these welds range from 0.025 up to 23 sq in. This process saves as much as 60 pct welding operation time.

37% SAVED on BRONZE BAR STOCK!

. . . by buying Asarcon 773 (SAE 660) in exactly the length needed.

If the shop had used standard 13" lengths of bronze, it would have bought 569 lbs. of metal . . . because the job called for twenty-one 8" lengths of 3" diameter tubular bars with a wall thickness of 1".

By ordering Asarcon 773 in exactly the length required . . . an 82" piece and a 90" piece . . . the shop bought only 356 lbs. of metal. Savings over 37%! And no short ends!

Asarcon 773 bar and bearing bronze is continuous-cast in diameters ½" to 5", cored or solid, in 105" lengths . . . 216 stock sizes of rods, tubes and shapes available. Distributors will cut this warehouse stock long or short in exactly the length you need.

Round or symmetrically shaped bars and tubes, special alloys and longer lengths can be made to order.

MINUTE MOVIE...
HOW A BLOW-HOLE ALMOST LOST THE ORDER

A machine shop bought 32 lbs. of bronze in a 13" rough cast 3¼" bar.
After the bronze was on the lathe for three hours, the operator uncovered a blow-hole . . .
. . scrapped the bar.
But all was not lost. The shop then ordered porosity-free Asarcon 773.
Since they could get exactly the length needed this was only 18½ lbs. (3" diam. x 8" long). Only 2½ hours of easy machining . .
. . the part was shipped.
P.S. JOB SAVED . . . CUSTOMER SATISFIED

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Send for this free catalog on Asarco Continuous Cast Bronzes. It contains physical properties, table of weights, photomicrographs, table of stock shapes and sizes and other data.

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The Iron Age
FOUNDED 1855

Anti-Justice

ONCE upon a time there was a sheep in the aluminum business. His name was Alcoa. He was a good sheep because he transformed aluminum from a precious laboratory metal to a commercial metal.

A lot of other sheep thought they wanted to make aluminum too, but they couldn't without a lot of money and gumption. But some were good sheep and kept their eyes and ears open planning for the day when they too would get into a business that was going places.

All at once the sheep found that someone had put wolf's clothing on him. He was accused by the Anti-Justice Dept. of keeping other good sheep out of the aluminum business. This came as a great surprise and it cost our friend a lot of money to defend himself.

The great protector, Anti-Justice, pored over papers and spent years and years calling the sheep nasty names—in the daily papers.

But lo and behold, while all this animal chattering was going on, and on, and on, a dark horse, Reynolds, came up in 1941 with the gumption and money, and another in 1946, Kaiser, seeking the green pastures of aluminum. They took advantage of what had been learned by the sheep—in wolf's clothing—and made good themselves.

Time passed and everyone in the kingdom was happy. They "gamboled" in the aluminum fields—until a mad bear threatened the world. Then more aluminum was needed pronto.

Then Anti-Justice decided that three is the wrong number—in the face of urgent defense needs. Anti-Justice was determined to get others in the field and his friend, Interior, held the power.

But it was hard to find more frisky dark horses who had enough money and were willing to gamble. So Anti-Justice blocked the use of already available equipment until a "suitable"—to him—fourth was found. Finally, one (Anaconda) showed up who had had his fill of copper shortages and wanted new fields. But Anti-Justice yelled monopoly because he was a big dark horse.

The moral: Does a monoply exist just because Anti-Justice calls it one, or do the courts decide? And what happens to the defense program while Anti-Justice fingerpoints without facts; and who's to blame? Certainly not the aluminum industry.

Tom Campbell

Editor

"dag" Colloidal Graphite Lubricates
Where Ordinary Lubricants Fail
At temperatures below zero, and up to 5000° F. in inert atmospheres, "dag" colloidal graphite is a lubricant that does not gum up . . . that defies break-down . . . that fights friction constantly. Easy to apply, too, by spray or brush.
"Dag" colloidal graphite is electric-furnace graphite specially processed by Acheson to make its particles microscopic in size, and far more slippery and durable than conventional petroleum lubricants. It is dispersed in a variety of organic and inorganic carriers for positive transmission to the zone of heat and for effective concentration there.
"Dag" colloidal graphite is available in dispersions designed to lubricate under all conditions of deep piercing, forging, stretch-forming, wire-drawing and ingot stripping . . . to assist in the parting of castings . . . to permanently lubricate moving parts that may be subject to extremely high or low temperatures . . . and in degreasing solutions which destroy ordinary lubricants.
More data on the advantages of "dag" colloidal graphite lubrication in metal-working operations is contained in a recent bulletin. Write for your free copy of Bulletin No. 426-13M
dag DISPERSIONS®
Acheson Colloids Corporation
Port Huron, Mich.
...also Acheson Colloids Limited, London, England

Dear Editor:

Letters from readers

Whose Sacrifice?

Sir:

With regard to the article in your Nov. 22 issue entitled "Does Labor Want Equality of Sacrifice?" please pass on to Mr. Fairless my appreciation and admiration for such a frank and honest analysis of the prevailing economic situation.

It's a splendid talk given by an outstanding man who should be heard more and more by a lot of labor leaders, laborers and politicians in the United States.

W. L. HOFF

Snyder, N. Y.

Sir:

In your Nov. 22 issue you published an article entitled "Does Labor Want Equality of Sacrifice?" We were deeply impressed by this article and we had thought it would be a very appropriate item to distribute to our employees through our plant information racks.

We would appreciate it if you would grant us permission to reprint the article for the above purpose, or if that is not possible, advise us how we may obtain permission to use it.

E. P. McERLEAN
Worthington Pump & Machinery Corp.
Harrison, N. J.

Croning Process

Sir:

The two articles on the shell molding process appearing in your Nov. 15 issue were read with interest.

We would agree generally with the content of the two articles. However, we were somewhat surprised to find claimed justification for costly pattern equipment for a jobbing production for about 100 molds per day, as stated in Mr. Calder's article.

We are also perplexed by the statement that Walworth is abandoning conventional green sand molding methods in all three of its foundries after being told yesterday of delivery of new Milwaukee molding machines, current installation of a sand system, a sandslinger unit, etc., in Walworth's Kewanee, Ill., foundry.

G. P. PHILLIPS
General Supervisor, Foundry Research
International Harvester Co.
Chicago

We should have said that the change at Walworth was being made in their Eastern Division only.—Ed.

Sir:

The two articles on the Croning process for shell molding that appeared in your Nov. 15 issue are very interesting and enlightening. A copy of these two articles in the hands of some of our personnel would indeed be helpful because of the clear description given. We would appreciate 12 copies.

M. S. ERB
Purchasing Div.
New Holland Machine Div.
Of The Sperry Corp.
New Holland, Pa.

Scarce Scrap Lost

Sir:

The editorial "Lost: Scarce Steel Scrap" in your Nov. 29 issue is of considerable interest to our industry, which is gradually becoming lean and gaunt due to the lack of steel necessary for survival.

You state that the traded scrap would produce 80,000 tons of ingots in this country. It would, therefore, produce 80,000 tons of ingots in England. Add to this the 46,000 tons which we will export and it appears that England would gain a total of 126,000 tons of ingots.

Assuming that our government has determined that 126,000 tons of ingots are essential for England's defense efforts, is it not preferable to have England furnish the labor and equipment necessary for processing a large percentage of this tonnage rather than for us to furnish finished steel and lose the labor and use of facilities which that tonnage of finished steel would require?

R. A. LOCKE
President
Steel Boiler Institute, Inc.
Philadelphia

Merry Christmas

Sir:

In your Nov. 22 issue we found a very interesting cartoon regarding ferro silicon on p. 61.

We would like to know whether or not we could obtain the original drawing and also whether or not we could use this cartoon in the form of a company calendar or Christmas card.

Oppenheimer Corp.
Buffalo

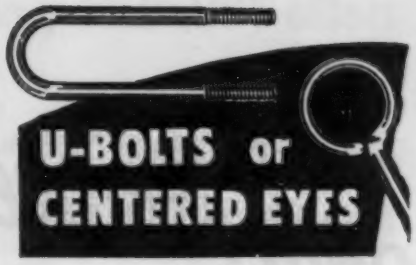
Back Up Flux

Sir:

We would like to have further information on the back up flux mentioned on p. 169 of your Nov. 8 issue.

R. S. DeFRIES
Research Dept.
Allegheny Ludlum Steel Corp.
Watervliet, N. Y.

Write to P. M. Klauber, manager, Research Div. of Solar Aircraft Co., 2200 Pacific Highway, San Diego, Calif.—Ed.



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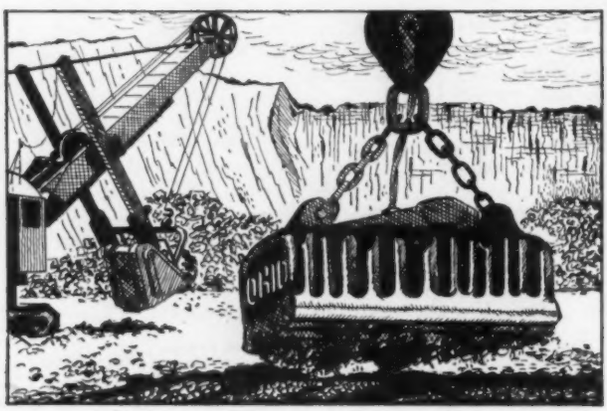
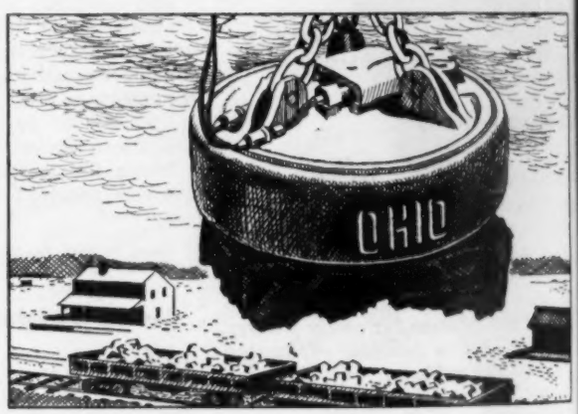
OHIO MAGNETS move ferrous metals FASTER...

Example:
RECOVERING SCRAP FROM SLAG DUMPS

1 With record pressure on steel mills, demand for scrap is at an all-time high. Scrap has many sources, including the mills themselves. And in slag dumps of many large mills, dependable Ohio Magnets are major tools for scrap reclamation. This Ohio Magnet handles a hefty 10-ton skull cracker ball to smash large chunks to furnace size.



2 Once-forgotten slag dumps are now being combed for valuable scrap. Power shovels dig deep into the dump, spread the broken slag for Ohio Magnets to sweep over. A 5% ferrous content in the slag is high, but efficient *Ohio Magnets make it pay.*



3 Powerful Ohio Magnets load cars quickly, automatically. In handling scrap, pigs, crop ends or rolled steel, Ohio Magnets assure speed and lower costs. For more data, write to Ohio Electric—*a leader in magnetic materials handling for over a quarter century.*

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Ohio ELECTRIC

Chester Bland President

Fatigue Cracks

by Charles T. Post

Trouble in Paradise

We knew it wouldn't last. Chief Keokuk, advertising mascot of Keokuk Electro-Metals Co., is a good Indian, and he fell hard when he ran into the luscious Princess Wenatchee. The woo he pitched won her, and when they settled down to raise a family in the advertising pages of your f.f.j. some readers thought the calm surroundings would find her clad in apron and housedress.

But Wenatchee isn't that kind of a gal. On the company's new calendar (you can get one by writing), she's up in the forefront again, and the family's pushed to the rear. If Chief Keokuk doesn't watch out, Chief Pontiac will be leering out from behind the April page on the calendar, and there'll be a massacre sure.

No Minks

Everyone knew these Washington investigations would have repercussions, but no one knew the backwash would hit Grand Rapids and Tulsa within a matter of weeks. With Christmas on top of us, the shock is going to be severe to those suppliers who bought their gift minks at summer prices and find themselves loaded with inventory.

As E. A. Herr, purchasing agent for Grand Rapids Brass Co.—and undoubtedly a man with a fine sense of humor—put it in a letter to his suppliers:

"For many years there has been a quaint practice of many sources of supply in sending gifts to customers at Christmas time. During current conditions, it might well be reversed and customers send gifts to a supplier."

But then he goes on to lay down the law that no supplier is to send any gifts to any of his company's employees, regardless of location.

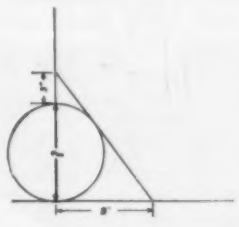
More recently, we received a notice from Harry Woodhead, v.p. and general manager of Douglas Aircraft's Tulsa division, to the same effect. Our Girl Friday laid it on our desk with a warning, "Big brother is watching you!"

So far as we know, we are the exclusive supplier to both of these firms of their most valuable information source—subscriptions to your favorite family journal. We're crossing them off our list to get minks this Christmas. Some lucky subscriber with less scruples will, therefore, get two.

Puzzlers

The only number that we know of that will fill the conditions of last week's puzzler is 142,857.

Not fooled by the encyclopedia puzzler were E. L. Feigenbaum, Ore Trading Corp.; J. Curry, Talon, Inc.; F. P. Boulais, Campbell Soup Co.; A. D. Kattelle, American Brake Shoe Co.; I. Ropp, Ropp & Blackstone; E. G. Leach, Dalton, Ill.; and R. W. Huff, Canton, Ohio. We have received another answer to C. E. Norton's interest rate problem from G. Fohl, Timken Roller Bearing Co., but we still don't understand how it's done.

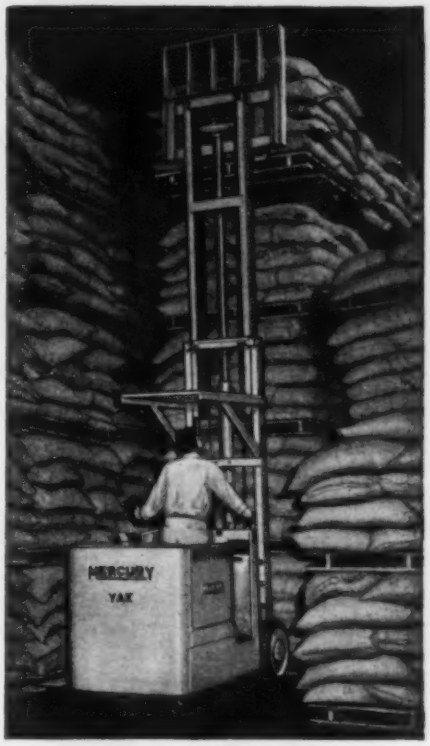


In the figure above what is the diameter of the circle when the dimensions given are 3 in. and 9 in.?

only MERCURY offers

"Balanced Suspension"

Eliminates destructive side force of off-center loads



"Balanced Suspension" is an exclusive feature of the MERCURY Hydraulic Lift System. *Patented* cross suspension of fork carriage eliminates unequal strain of off-center loads on uprights and ram. One of the many important reasons MERCURY Fork Trucks perform with the highest efficiency year after year.

For the complete story on MERCURY Fork Trucks in capacities of 2,000 to 6,000 lbs. request Bulletins 295, 210-A and 210-B.

MERCURY

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Unusual Tool Capacity
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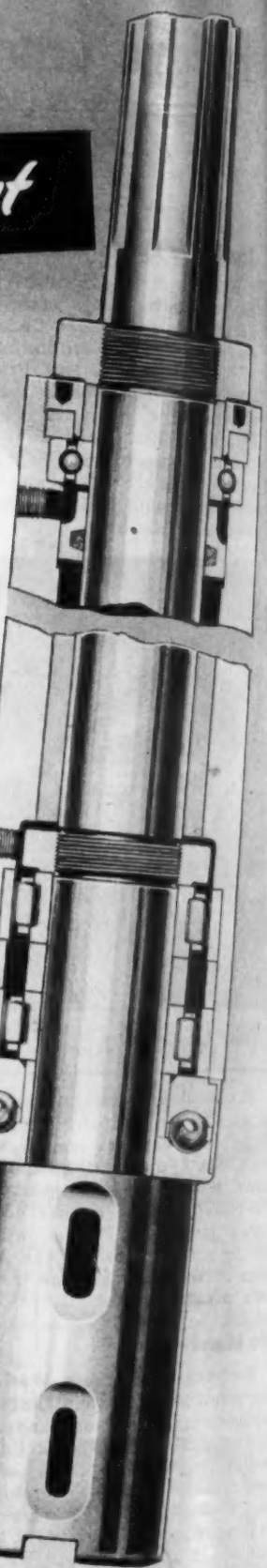
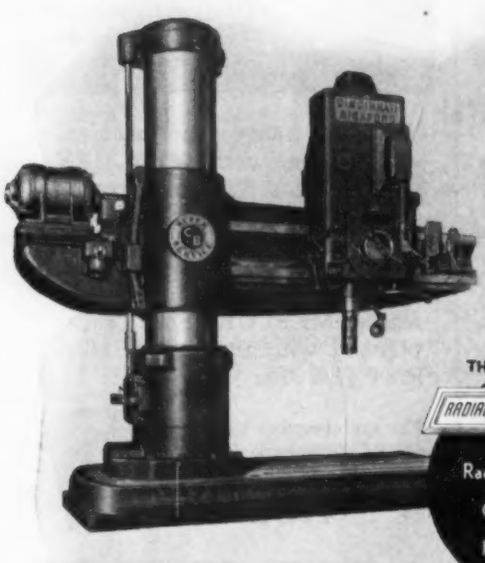


What is full spindle support? What does it accomplish? It's rigid support against thrust and radial load—at ALL positions of the spindle.

In performance, it means accurate, smooth power delivery and long, trouble-free operation.

The multiple spline driven Cincinnati Bickford Super Service Spindle—with its large thrust bearing and its special sliding sleeve—never feeds away from its bearings.

This modern, up-to-date design, with 36 speeds and 18 feeds, also gives a maximum tool capacity for any given size.



Write for Circular R-29 for details of construction of this Cincinnati Bickford Super Service Radial Drill.

This machine is furnished in sizes 11" to 19" diameter column, 3' to 8' arm.

THE CINCINNATI BICKFORD TOOL CO.

RADIAL AND UPRIGHT SUPER SERVICE DRILLING MACHINES

Radials 7½" dia. col., 2½' arm, to 26" dia. col., 12' arm.
General purpose Uprights, 21" to 28" sizes.
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Jig Borers, Portable Horizontals, Spacing Table Machines.

Equal Efficiency of Every Unit Makes the Balanced Machine

THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9, Ohio U.S.A.

Conventions & Meetings

1952

Jan. 5—American Home Laundry Manufacturers Assn., annual meeting, Morrison Hotel, Chicago. Association headquarters are at 38 S. Dearborn St., Chicago.

Jan. 8—Mining & Metallurgical Society of America, annual meeting, Mining Club, New York. Society headquarters are at 11 Broadway, New York.

Jan. 8-9—Power Crane & Shovel Assn., annual meeting, Washington, D. C. Association headquarters are at 74 Trinity Place, New York.

Jan. 8-10—National Constructors Assn., annual meeting, Waldorf-Astoria Hotel, New York. Association headquarters are at 50 E. 41st St., New York.

Jan. 10-11—Aluminum Window Manufacturers Assn., annual meeting, Miami. Association headquarters are at 74 Trinity Place, New York.

Jan. 13-15—Institute of Scrap Iron & Steel, annual convention, Waldorf-Astoria, New York. Institute headquarters are at 1729 H St., N.W., Washington.

Jan. 14-17—American Management Assn., general management conference, Biltmore Hotel, Los Angeles. Association headquarters are at 330 W. 42nd St., New York.

Jan. 14-17—Plant Maintenance show and conference, Convention Hall, Philadelphia. Exposition management, Clapp & Poliak, Inc., 341 Madison Ave., New York.

Jan. 14-18—Society of Automotive Engineers, annual meeting, Hotel Book-Cadillac, Detroit. Society headquarters are at 29 W. 39th St., New York.

Jan. 16-18—Society of Plastics Engineers, annual national technical conference, Edgewater Beach Hotel, Chicago. Society headquarters are at 409 Security Bank Bldg., Athens, Ohio.

Jan. 17—Steel Shipbuilding Institute, winter meeting, Hampshire House, New York. Association headquarters are at 600 Fifth Ave., New York.

Jan. 18—Malleable Founders' Society, semi-annual meeting, Hotel Cleveland, Cleveland. Society headquarters are in the Union Commerce Bldg., Cleveland.

Jan. 21-22—Compressed Gas Assn., annual meeting, Waldorf-Astoria Hotel, New York. Association headquarters are at 11 W. 42nd St., New York.

Jan. 21-22—Industrial Furnace Manufacturers Assn., mid-winter meeting, Hotel Schenley, Pittsburgh. Association headquarters are at 420 Lexington Ave., New York.

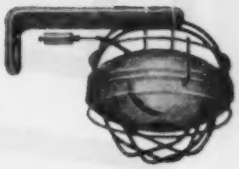
Jan. 21-25—American Institute of Electrical Engineers, winter meeting, Hotel Statler, New York. Institute headquarters are at 33 W. 39th St., New York.

Jan. 28-30—Truck-Trailer Manufacturers Assn., annual convention, Shamrock Hotel, Houston. Association headquarters are at 1024 National Press Bldg., Washington.

Which do YOU need to protect YOUR business from FIRE?

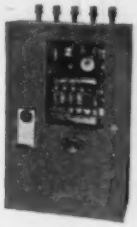
Kidde Multi-Jet Nozzle. The "business end" of a Kidde CO_2 fire extinguishing system. It blankets flame with fire-smothering carbon dioxide.

Kidde Dry Chemical Wheeled Extinguisher. A "one man fire engine" to control large fires in flammable liquids, live electrical equipment.

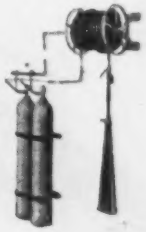


Kidde "Heat Detector". 24 hours a day this sensitive detector stands guard ready to set off a Kidde CO_2 system automatically if fire should strike.

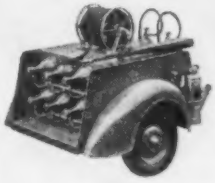
Kidde Carbon Dioxide Portable. Fast-acting . . . easy to use. A pull of the trigger releases a rolling fog of CO_2 gas that smothers flame instantly.



Kidde Smoke Detector. A new development in industrial fire fighting. Detects hidden smoldering fire, tells in which room or vault it is located.



Kidde CO_2 Hose Reel Equipment. Combines the convenience of a portable fire extinguisher with the great fire killing power of a built-in system.



Kidde Trailer. An economical, fast-acting unit for thorough-going fire protection in smaller plants and airports and auxiliary protection in larger ones.

Kidde Chemical Extinguishers. Foam, Soda-acid or water portable extinguishers in stainless steel. Two-and-a-half gallon capacity. Easy to use, reliable, economical.

Kidde Vaporizing Liquid Extinguisher. Approved for fires in flammable liquids and electrical equipment. Discharges carbon tetrachloride.

For many years Walter Kidde & Company, Inc. has specialized in fire extinguishing equipment. It ranges from 2½ pound portables to huge built-in systems. Need advice on protection for your plant? Call or write Kidde.

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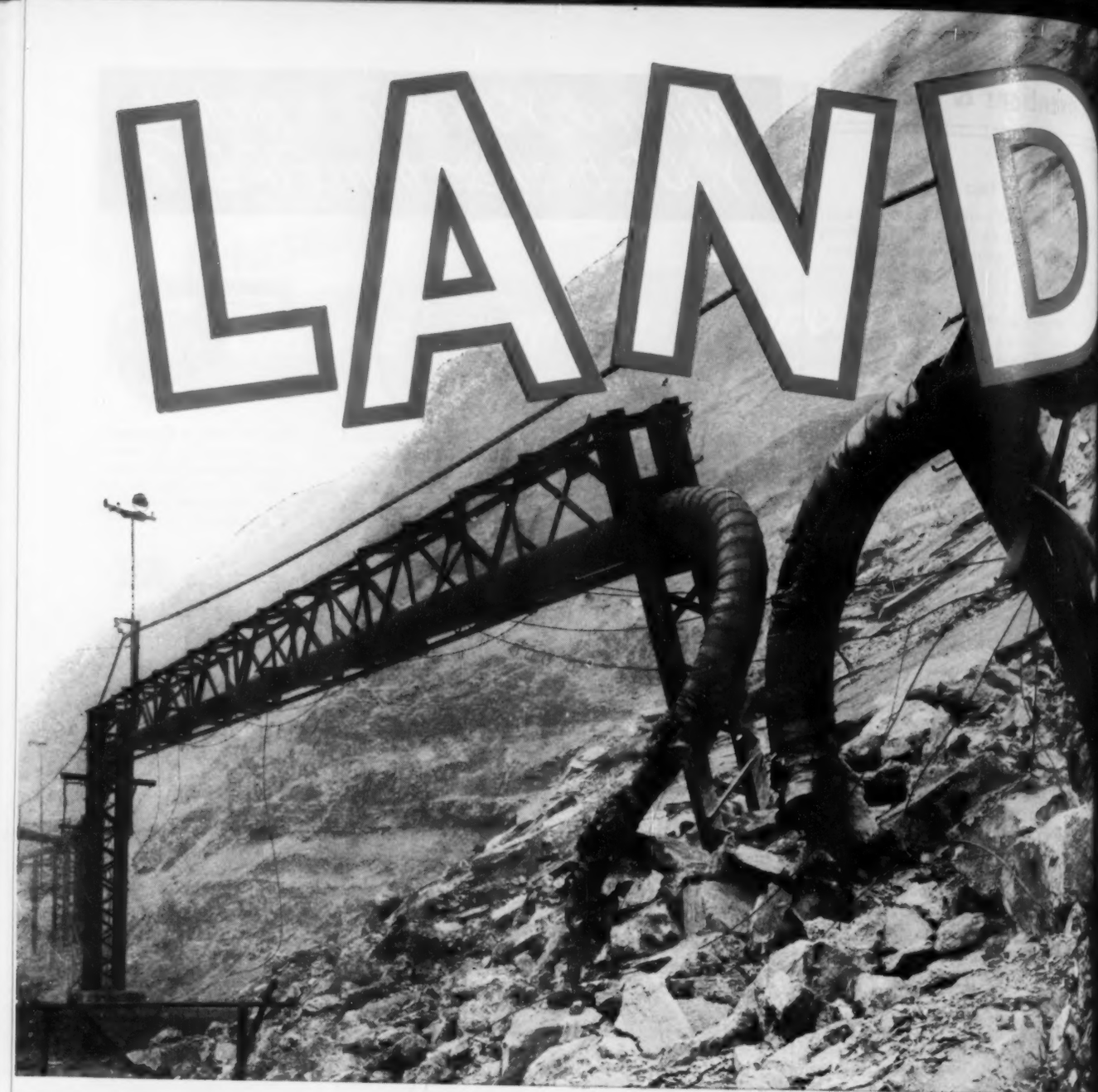

Decem

the Iron Age
FOUNDED 1855

THE IRON AGE Newsfront

► Steel parts of controlled density can now be made directly from iron ore. Ore of minus 60 mesh is made directly into the desired shape by a direct reduction process at 2000°F. Part density can be controlled over a range of 1.0 to 7.2. (Normal steel density is 7.8 grams per cc).

► To meet growing demand for aircraft quality boron steels a Cleveland warehouse will stock five grades of boron steel (aircraft quality) in heat lots.

► Hudson's announcement of a new light car means Detroit will again review the light car situation. This confirmation of reports that have existed in Detroit for over a year brings to four the number of independent automakers that have embarked on light car programs while the big three have held to their present models.

Washington favors "economy" cars because of the materials saving --which gives the trend a push.

► Aluminum showcases will soon line the walls of some Paris subways, replacing posters.

► Army Signal Corps research indicates that some vacuum tube amplifiers may be replaced by ceramic (crystalline) materials. Barium titanate, now used mainly in phonograph pickups, has a high dielectric constant at high frequencies. It also has a good "memory," which could be useful in electronic computers.

► The new lean alloy TS8100 steel series is replacing boron steels in some small ring gears. One company has switched from 94B17 to TS8123 (resulfurized) to get better machinability and less distortion in heat treatment. Another company has given up trying to use 80B20 in favor of TS8126.

► Several U. S. manufacturers (not machine tool builders) have banded together to try to have machine tools built for them in Germany and France. They would have to be built to American designs. The hope is that they could get better delivery and lower prices.

► Defense Transport Administration has ordered 1200 overage locomotives held in reserve for possible emergency use. The locomotives would normally have been scrapped.

► Steel warehousemen who have been getting alloys richer than the 8600 series will probably find their supplies cut off. Washington intends to eliminate them from approved melt schedules.

Aside from making it more difficult for steel companies to sell off-heats, this will make it harder for machine tool builders to get from warehouses some of the alloys they now buy from that source.

► A midwestern manufacturing firm has found a way to increase the life of the screwdriver bits it buys. As a test, the bits were subjected to a temperature of -120°F for an hour, then put in boiling water for 5 min. This cycle was repeated several times with the result that their life was increased from 1½ to 5 times the normal for that company.

controlled or not...

gives you *more parts* per pound

CMP'S special high precision mills insure exceptionally-close thickness tolerances and across-the-width gauge uniformity in THINSTEEL. With oversize variation kept to the minimum you are assured more footage — as much as 175 square feet per ton in lighter gauges — as compared with a standard commercial product.

BOTH WERE ORDERED 3/4" x .015". BOTH WEIGH 1/2 OUNCE.

The tagged piece is precision rolled THINSTEEL and is slightly over 9½" long. The other is ordinary strip on the high side of the allowable gauge tolerance — .002" oversize — and is slightly less than 8½" long.

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CRANES: Shortage Crimps Steel Output

Below-capacity operations of cranemakers result from poor allocations . . . Steel expansion hurt, ingot production lost . . . May be too late to avert further steel loss —*By J. B. Delaney.*

A shortage of steel mill cranes has already hurt the nation's steel expansion program. Vitally-needed ingot production has been lost. It appears too late to avert further loss of production.

Yet, on hot metal crane assembly floors at Alliance, Ohio, at least six cranes in varying stages of construction have been delayed for lack of materials—five for 30 days, another for 6 weeks. Large areas of these same assembly floors are not being utilized.

Early this year, one of the two builders of steel mill cranes was down to 40 pct of capacity. At a time when crane orders were building up to mountainous proportions, this same builder was forced to accept subcontracting work on a limited basis to hold onto his skilled workers.

Help on Way?—The picture has brightened recently, and the builders have been promised long-delayed help by National Production Authority.

This would be none too soon for the builders, who have been knocking futilely at NPA's door for the last 10 months. The matter was brought to a head at a Washington meeting of NPA, crane manufacturers, and worried steel producers on Nov. 27. The meeting followed NPA's order limiting the builders in first quarter of 1952 to an overall 42 pct of the materials consumed by them in their base period. One builder's plate allotment was cut to 17 pct of the base period. Another meeting was scheduled for last Monday.

Basically, the troubles of the crane builders are due to the fact they were not given the priority rating consistent with their importance to steel expansion. As a result, they had to compete for materials and components with other materials handling equipment manufacturers. In World War II they came under the tools division—and got along fine. Now they are in the general industrial equipment division.

Better Rating—The industry is hopeful that NPA will give it a better rating.

Meanwhile, lack of a stripper crane has delayed full utilization of new capacity by a big steel producer. This same producer will lose all or part of the early production of four new openhearths that will be ready to produce next March. The necessary cranes are scheduled for delivery next June —and about 6 weeks are required for installation. Possible production loss: 400,000 to 600,000 tons. Cranes are a factor in the probable delay of other new melting facilities.

MORE STEEL: New furnace capacity, like this 250-ton openhearth at Bethlehem Steel Co.'s Steelton, Pa., plant may be held back unless the shops get the cranes they need.

In an effort to minimize the effect on steel expansion NPA is reviewing the order books of builders with the intention of proposing changes better to match deliveries with scheduled start of new facilities.

The crane makers are promising delivery in 24 to 30 months. That is, if they can obtain the needed materials to raise production. Otherwise, further extension of delivery dates will be necessary.

Shortage Items — Critical items are steel, copper, roller bearings, hardened gears and pinions, and castings. Electrical equipment is bothersome, but not so critical. The industry consumed miles of copper wire—5 to 6 miles in one big ladle crane. Total weight of such a crane is around 1,400,000 lb, largely steel and castings.

The industry's problems have been compounded by the demand for heavier equipment to accommodate output of larger furnaces and bigger ingots. Steel mill cranes are tailor-made anyway and there is no chance of stockpiling parts.

The need for heavier equipment has meant complete re-engineering and design. Capacity of ladle cranes are up from 250 tons to 350 and 400 tons, stripper cranes from 200 to 400 tons, openhearth charging machines from a range of 7½ to 10 tons, to 12 to 15 tons, soaking pit cranes from an average of 15, to 25 tons—sometimes 30 tons.

ALUMINUM: New Kaiser Plant Opens

Chalmette to be largest producer in U. S. . . . Eight potlines will yield 200,000 tons yearly . . . Use natural gas as power source . . . Alumina made from Jamaica bauxite at Baton Rouge.

The same Henry Kaiser whose enthusiasm for industry built ships, dams, steel plants has "added again"—this time to his aluminum holdings.

Although a comparative latecomer in the business he is cutting down the lead of others. His new industrial giant started productive life this week when the first metal was poured at Kaiser Aluminum & Chemical Corp.'s Chalmette plant at New Orleans, La.

Henry Kaiser has confidence in aluminum. He doesn't think it's a metal that booms in war and dies in peace. He sees endless new applications and consumption figures towering higher each year. That's the reason for the Chalmette plant's existence—and the fact that Mr. Kaiser won't stop there.

Morale Builder—He is also lifting the spirit and morale of southern industry with this expansion. He did the same in the West with steel. Other industry follows his expansions.

The new plant is scheduled to produce 200,000 tons of aluminum annually when fully completed in mid-1953. Largest primary aluminum plant in the country, it marks a major goal in the drive for more light metal production to meet military and civilian needs. Its output will be greater than that of the whole U. S. before World War II.

Eight potlines with 1152 electrolytic cells will turn out 23 tons of metal each hour—about 40 lbs per pot. About $150 million worth of materials, machinery, and labor will go into the 75-odd buildings of the finished plant.

Other Plants — The two other Kaiser aluminum reduction plants at Mead and Tacoma, Wash., are already producing at rates of 145,000 and 25,000 tons a year, respectively. When the Chalmette plant is in full operation, the company will have a total capacity of 370,000 tons annually and will represent slightly over 25 pct of the nation's aluminum industry at the end of 1952.

If current plans are carried out, Aluminum Co. of America will have a capacity of 653,750 tons per year, or 44.4 pct. Reynolds Metals Co. will have a capacity of 394,000 tons annually, or 26.8 pct. And the joint Anaconda Copper Mining Co.-Harvey Machine Co. venture at Kalispell, Mont., will have a capacity of 54,000 tons per year, or 3.7 pct of the total industry annual capacity of 1,471,750 tons.

An interesting note on Kaiser financing is that government surplus aluminum plants bought by Kaiser after the last war were paid for in full this year. The final payment, made in the middle of February, of $37,394,250 was a full 23 years ahead of schedule and raised total government receipts for principal, interest and rental on the five plants to $56,313,789.

The first use of natural gas to supply power for the reduction of aluminum was made at Reynolds' Jones Mills, Ark.

Many Firms Help Build Kaiser Plants

Listed below are some of the major firms helping to build the Chalmette plant. Contracts totaling more than $45 million have been awarded to date by Kaiser Engineers for equipment and materials for the new plant.

American Forge Mfg. Co., Pittsburgh.
Atlas Contracting Co., Alexandria, La.
Atwood & Morrill Co., Salem, Mass.
Bailey Meter Co., Cleveland.
Barnett Co., Barberton, Ohio.
Berger Engineering Co., Seattle.
Blattmann Sheet Metal Works, New Orleans.
Buffalo Forge Co., Buffalo.
Builders-Pacific Inc., Berkeley, Calif.
C. F. Bulotti Machinery Co., San Francisco.
Buran Equipment Co., Birmingham.
Butler Mfg. Co., Kansas City.
Chain Belt Co., Milwaukee.
The Clark-Aiken Co., Lee, Mass.
Clark Equipment Co., Buchanan, Mich.
Coast Equipment Co., San Francisco.
Consolidated Western Steel Corp., Orange, Tex.
Crane Co., Chicago.
Custodis Construction Co., New York.
Cutler-Hammer Inc., Milwaukee.
Cyclops Iron Works, San Francisco.
Delta-Star Electric Co., Chicago.
Duff-Norton Mfg. Co., Pittsburgh.
Foster Wheeler Corp., New York.
Gardiner Mfg. Co., Oakland, Calif.
General Conveyor Co., San Francisco.
General Electric Co., Schenectady.
GE Supply Corp., Schnectady.
General Machinery Co., Spokane.
Gilmore Steel & Supply Co., Oakland.
Grinnel Company, Inc., Providence.
Griscom-Russell Co., Chicago.
Holzer Sheet Metal Works, New Orleans.
Incandescent Supply Co., San Francisco.
Industrial Machinery Co., Forth Worth.
Ingersoll-Rand Co., New York.
Jahncke Service, Inc., New Orleans.
Jamar-Olmer Construction Co., Houston.
Johns-Manville Sales Corp., New York.
Joy Mfg. Co., Pittsburgh.
Clifford A. King, New Orleans.
Larkin Electro Products, New York.
Lead Products Co., Houston.
Leclede Steel Co., New Orleans.
Logan Clay Products, Logan, Ohio.
MacDonald Engineering Co., Chicago.
Manning, Maxwell & Moore, Bridgeport.
Midwest Piping & Supply Co., St. Louis.
Nordberg Mfg. Co., Milwaukee.
Northern Engineering Works, Detroit.
Olympia Roofing Co., New Orleans.
James F. O'Neil Co., New Orleans.
Pacific Car & Foundry Co., Renton, Wash.
Patterson Foundry & Machine Co., East Liverpool, Ohio.
Harold R. Peterson Inc., Los Angeles.
Poydras Lumber Co., New Orleans.
Henry Pratt Co., Chicago.
Republic Supply Co., Los Angeles.
Revere Copper & Brass, New York.
Robinson Clay Products Co., Akron.
Jos. T. Ryerson & Son, Chicago.
Fred Simonson, New Orleans.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Syntron Co., Homer City, Pa.
Tay-Holbrook Inc., San Francisco.
J. T. Thorpe & Son Inc., Emeryville, Calif.
The Trane Co., La Crosse, Wis.
United Gas Pipeline Co., New Orleans.
Westinghouse Electric Corp., Pittsburgh.
Westinghouse Supply Co., New York.
Carl E. Woodward, Inc., New Orleans.
Woodward, Wight & Co., Ltd., New Orleans.
Worthington Pump & Machinery, Harrison, N. J.
The Yale & Towne Mfg. Co., Stamford.

Good Location—The Chalmette plant occupies a 280-acre plot fronting on the Mississippi River. The site has the advantages of proximity to Kaiser's bauxite mines in Jamaica, and its alumina plant at Baton Rouge. Availability of natural gas and transportation facilities are also plus factors.

The potline now in operation was rushed to completion after construction began in February, 1951. Kaiser Engineering, designers and builders of Chalmette, are using an average work force of 3500 men to push the building ahead of schedule. The finished plant will employ about 2000 people.

Gas Fuel—Electric power—nearly 10 kw-hr per lb of metal produced—will be furnished by two plants. Fired by natural gas, the plants have a combined capacity of 478,000 kw. Electricity for six of the potlines is supplied by a steam power plant with 16 ac turbo-generators. Rectifiers convert the ac current to dc for reduction purposes. The other two lines are fed by 80 Nordberg radial gas engine dc generators.

Huge quantities of raw materials will feed the plant. Chalmette will consume annually 178,000 tons of alumina, 88,000 tons of petroleum coke, 34,000 tons of soft pitch, 6000 tons of cryolite, 5000 tons of aluminum flouride, 4000 tons of anthracite, 50 billion cu ft of natural gas, and 180 billion gal of water.

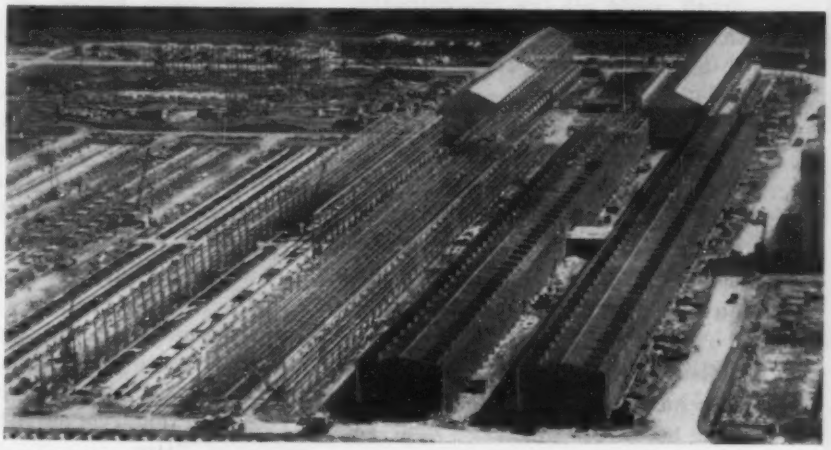
Alumina will come from Kaiser's Baton Rouge plant. Ultimately this plant will use bauxite ores from the Kaiser mines in Jamaica. Quantity ore shipments are scheduled to start in the third quarter of 1952. Estimated annual capacity of the mines will be about 1 million tons.

Carbon Paste—Petroleum coke, soft pitch, and anthracite will be blended in a carbon paste plant. Mixture is baked solid and used for anodes and cathode lining in the reduction cells.

Natural gas and water will be processed in special plants. Gas is delivered through a 36-in. pipeline, the water pumped from the Mississippi.

The new plant is part of Kaiser's $200 million mine-to-metal expansion program. Plans include a 60 pct production increase at the Baton Rouge alumina plant, increased bauxite production at the ore mines in Jamaica, and improvements at the Mead reduction plant in Spokane.

LAST STEP: Lifting a 1000-lb aluminum pig from the mold in which it was cast.



CONSTRUCTION: Four of the 16 potroom buildings at Chalmette plant.

PIG: Molten aluminum being poured into pig molds after electrolytic reduction.

POWERHOUSES: Construction work on the two powerhouses at Kaiser plant.

WAGES: Steel Talks Without Fanfare?

"Personal" miracle needed for steel-union wage problem . . . Ignoring preliminaries could minimize government meddling . . . Murray knows he holds a lot of aces—*By Tom Campbell.*

A "personal" miracle might clean up the steel-wage problem in short order. But there is little chance of Phil Murray and Ben Fairless producing such a miracle. If they could sit down and quickly brush aside all the preliminaries that usually occur in wage battles things could be different.

These two men are too far apart —probably farther than they have been in the past 10 years. Mr. Murray is bound to try to get his union everything he can while the going is good. Reducing his demands to an absolute minimum quickly does not seem in the cards.

Seat for Government—Mr. Fairless has said that the government will be in on the wage deal because it controls wages and prices. He thinks that the sixth round in wages is bad for the economy, the workers and the country. He is certain that there can be no wage increase unless prices are raised to offset higher labor costs.

If these two men could reach a quick working idea of the best each could do and lay it before government officials a crisis could be definitely staved off before Jan. 1—providing government acted as quickly. Such a move would also eliminate the probability of a "big stick" policy on the part of the President—who will probably try to use it if things are in a dither at the year's end.

Two other outs, both of which have a zero chance, are: no wage increase and no price increase for the time being; and a small wage increase and a small price increase. It would be naive to expect either of these.

Dispute Pattern—Industrialists believe the worst that could happen, for steel firms and for the country, would be the following: deadlock at the end of this month; then the President publicly demanding "that both sit down and reach an agreement." That of course they can't do while the government has the say-so on prices and wages. An impasse would bring admonition by Mr. Truman to be followed by a wage panel. And the panel would find in favor of the union.

The tension increases as steel firms try to get OPS to sanction a price increase to take care of increased labor costs. That would take time. By then, chances of a shutdown in the steel industry would be a daily hazard. The wage raise could be retroactive while the price increase would be "as, if and when."

Stand by Wilson?—The steel industry has the full weight of union power against it because of high demand and defense plus an administration that favors labor. The question mark is Mr. C. E. Wilson who might take a stand against an above-ceiling steel wage increase. That could bring about a crisis between him and Mr. Truman. It could mean a Wilson resignation if Mr. Truman did not support a hold-the-line policy—if it were adopted by Mr. Wilson.

The steel wage fracas will be the national guessing game between now and Jan. 1. Neither labor, steel, nor government want a strike. All three know all the factors in the current time bomb. That's why a "personal" miracle seems the only way out of labor trouble in the steel industry.

Steel Firms Figure Wage Costs

Preliminary analysis of steel labor demands indicates the impact on individual companies will vary.

Steel producers have been working feverishly at the job of determining cost of the so-called "fringe" issues raised by the CIO United Steelworkers. Answers

"Won't accept discriminatory wage order."

"Stockholders do all the sacrificing."

have been startling to the point where statisticians are wondering whether to believe their own figures. One steel source totaled all 12 union demands and came up with a total of 40¢ per hr.

The demand for time and one-half pay on Saturday, double time for Sunday, is a case in point. One producer in preliminary figuring was knocked for a loop with his cost estimate of 23¢ an hr. Other producers came up with 3 to 4¢.

Reason for the wide difference may be that the one producer has arranged his work schedules so that at the present time few workers are receiving overtime pay for these 2 days because they fall into the regular work week. Some mills, however, already are paying large numbers of employees overtime for Saturday and Sunday work in preference to hiring hundreds of additional workers.

Cost 7¢ an Hour—Another mill estimates that the eight paid holidays demanded would cost about 7¢ an hr.

One other union demand likely to prove costly is that for increased shift differentials. Producers were more than mildly interested in the differential agreement entered into by the union and Pittsburgh-Des Moines Steel Co. last week after a 65-day strike. This agreement calls for increasing shift differentials from 4¢ (afternoon shift) and 6¢ (evening shift) to 6 and 10¢, respectively. The assumption is that this had the blessing of the international union and may be the pattern sought by the USW. Pittsburgh-Des Moines also granted the union shop and pay raises ranging from 6½¢ to 16½¢ an hr. The raise was said to be within the wage stabilization formula.

WSB Grants Copper Pay Increase

Wage Stabilization Board last week approved a pay increase of 15¢ per hr for the greatest part of the copper industry.

In order to fit the increase into its wage-ceiling rules, WSB ruled that 8¢ of the increase was an across-the-board hike permitted by its cost-of-living formula, and that 7¢ was for job reclassifications.

SCRAP: Shortage Changes to Crisis

November, December shipments drop sharply . . . Winter industrial scrap letdown seen as causes . . . Scrap trade should still get credit for keeping up steelmaking—*By T. Metaxas.*

The shortage of scrap iron and steel that has been nipping at steelmaking all year long has become a crisis in some areas. Strengthened by winter and sinking collections of scrap from manufacturers, it has closed in to do some serious in-fighting with the scrap and steel industries.

The flow of industrial scrap has skidded because of civilian production cutbacks imposed by restrictions on materials.

For 11½ months steelmaking maintained its high perch despite the scrap shortage. Now some openhearth furnace shutdowns appear imminent. Scrap receipts have taken a sheer drop in November and December and steel mills are leveling stockpiles that were already much too skimpy for winter.

Scrap men believe the crisis will continue for a month. Weather will hold the key to survival of the high operating rate. A freeze could stop outdoor scrap preparation work and snow under rail transportation of scrap. Ordinarily, mills would have been cozy with mountains of stockpiled scrap to see them through the lean cold months.

The larger steel producers, because of the greater tonnages of scrap consumed, were closer to openhearth shutdowns than at any time this year. National Production Authority's scrap allocations system seemed to be the only way to safety. It was a flimsy crutch.

Despite the current trouble, the scrap industry had this year almost completed the "impossible" job of supplying metals producers with sufficient scrap to maintain record-breaking production.

The scrap trade may now be deprived of the full honors it should get if a few openhearths are banked during the next few weeks. Sometimes exaggerated publicity accorded these openhearth shutdowns may outbalance the importance of the steel lost and be indirectly harmful to the reputation of the industry.

Scrap men have shipped more scrap this year than ever before. Shipments of purchased scrap in the first 9 months of 1951 were 25,-

SCRAP: Iron and steel scrap is unloaded in front of Van Cleve Hotel, Dayton, Ohio, during a 1-day Scrap Drive. Watching at extreme left is Clifford Finnley of NPA, picked as Citizen of the Week by Dayton radio station WING.

163,000 gross tons. Taking into account the letdown in shipments for November and December, shipments for the full year should be an estimated 33.4 million tons.

Accepted purchased scrap goal for 1951 was set at 36 million tons. Part of the deficit must come out of industry scrap stockpiles. Some scrap has by-passed normal scrap channels and gone directly to steel mills. This was not included in the scrap trade total.

Blast furnaces have been making more pig iron this year. The ratio of 50 pct scrap to 50 pct pig iron has been altered slightly. More than 54 pct hot metal is being charged into openhearths to counterbalance the scrap shortage and in some cases 75 pct pig is now being used.

Blast furnace production in the first 10 months of 1951 totaled 59.3 million tons, a gain of 4.9 million tons over last year.

An assist to the scrap industry has been the nationwide industrial scrap drive organized by NPA and the steel industry. Industries and plants have been canvassed for scrap by local committees and steel and warehouse salesmen.

Orchids to Scrap Drive

By W. W. Taylor

Ten tons of scrap dumped in the lobby of a fashionable hotel, 100 tons more on its doorstep, an orchid and a Christmas tree made of scrap metal, scrap searchers outfitted in hunting clothes or white smocks were the promotional gimmicks that pulled an entire town wholeheartedly into a scrap iron and steel collection drive.

Sponsors of an all-day scrap steel campaign at Dayton, Ohio, were the Dayton Sertoma Club, scrap mobilization committees, and the Van Cleve Hotel—which graciously permitted unloading of scrap in its lobby. The event served a double purpose of enriching the flow of dormant scrap to the needy steel industry and being a Pearl Harbor Day memorial.

Reward for a good day's work by the Sertoma Club was presentation of an orchid made of scrap. All day long Auto Club members rode a truck decked out as a hunting scene. Riders were dressed as hunters. Above them a sign read: "Hunting for Scrap."

The orchid idea was generated by the Cleveland NPA office. Metal work was done by the Pressed Metal Institute from bits of scrap metal. Similar orchids may be presented to people and companies doing outstanding scrap drive work in other areas.

The "Christmas tree" in the hotel lobby has a 4-in. flue pipe for a trunk, toilet tank float balls, turnings, head light covers, and other miscellaneous scrap items make up the foliage and decorations. Promotion-wise Sertoma Club had Dayton professional basketball players pin decorations on the tree. To reach the top, one player stood on another's shoulders.

End of the 1-day scrap drive won't close Dayton's contributions to the nationwide scrap campaign. The Mayor has signed an order for the raising of abandoned street car rails. Work began last Monday morning.

If the extra $25 a ton allowed for street car rail recovery by OPS is not sufficient to cover costs, Dayton will foot the deficit. The city feels that the loss will be local industry's gain.

Jalopies—Autowreckers, said to hold a huge cache of junk car scrap, have been organized for months. Their shipments have increased substantially but NPA demands more. The government agency has instituted an inventory turnover order for graveyards—almost a requisition.

Autowreckers may also lose steel mill customers for their junk cars. OPS is preparing an order that will prohibit mills from buying jalopies as cars and not as scrap. Autowreckers were able to get higher prices but OPS claims that the end use of the car is as scrap and ceiling scrap prices must be paid.

Some scrap sources say the new get-tough policy of OPS may be a grave deterrent to scrap collection if extended. OPS is prosecuting a Pennsylvania scrap man for allegedly trying to sell upgraded material. The scrap was downgraded by the consumer.

The intent to upgrade is the gimmick OPS is hanging its case on. But traditional procedure is to ship scrap to a consumer who can downgrade if the dealer agrees.

The scrap trade also resents the credence some high Washington officials gave to reports that scrap dealers were hoarding scrap for the rest of '51 to avoid entering higher tax echelons. Why any hard-headed scrap man should withhold scrap in 1951 so that he can pay higher taxes on his revenue next year is a weird point of logic.

SUBCONTRACTS: How to Get Them

Speeches eliminated, individual attention added in AFRC-NPA project . . . Called "unqualified success" . . . Need small shops with facilities for close-tolerance work—*By R. L. Hatschek.*

Small business was the main beneficiary of a recent cooperative National Production Authority-Armed Forces Regional Council program, in the Scranton and Wilkes-Barre, Pa., area. The other beneficiary was the defense effort.

Basic premise of the program was that hot air and speech making couldn't do any good for either (THE IRON AGE, Aug. 2, 1951, p. 107).

While the purpose was not to arrange contracts but to find capable firms, some $6 million worth of contracts have already been awarded as a direct result of this particular program.

Individual Interviews — NPA field offices provided the knowledge of local conditions and idle facilities. Then representatives of the Army, Navy and Air Force, NPA and some prime contractors just sat down and interviewed—one by one—all of the small outfits in the area that wanted to do government work. There were 185.

Specific information requested from the small businesses included: Nature of the business or product, type of previous defense work, number of skilled and unskilled employees, general type of work the firm was set up to do, and whether or not the shop was capable of expansion.

This particular effort has been labeled "an unqualified success" but the reason given for the delay in establishing such a program was a "lack of intelligent self-help by the firms and community organizations."

Not Qualified—The main difficulty in placing Navy contracts, according to Capt. H. A. Ingram, Inspector of Naval Materials in Philadelphia, is finding firms that are capable of doing close-tolerance work required in modern arms. One prime contractor in the area, for instance, has been trying to subcontract a difficult sheet metal job — forming jet afterburner tail cone segments of tough 1/16-in. alloy steel to 0.001-in. tolerance. This firm, still making the segments, is ready and willing to show how it should be done but there just aren't any takers.

Lt. Cmdr. M. S. Sharpe, of the same office, told THE IRON AGE that the best way for a small company to get war work is to go after these tough jobs that others won't tackle. This reaps many benefits for the small shop. Tough jobs aren't bid as heavily and so are easier to get and pay better. When successfully completed, they build prestige for the shop in the eyes of customers—prestige which outlasts the emergency.

Help Yourself—Small shop operators can help themselves in getting this type of work by determining the extent of their engineering ability, the precise skills of their help and the capabilities of their machines.

Next move is to contact procurement agencies or prime contractors and sell the shops' production facilities. Many short-run items are needed and prime contracts are available on these. While the Armed Forces cannot award subcontracts, they do know where the prime contracts are and they can refer small businessmen to the prime contractors.

MORE STEEL: Reuben E. Sommer, president and general manager, Keystone Steel & Wire Co., examines the jet tap used on the new openhearth furnace the company has just placed in operation. Looking on are: (left to right) A. R. Edwards, openhearth superintendent; Henry G. Sommer, board chairman; and A. H. Sommer, steel plant superintendent. New furnace will raise Keystone's annual capacity to 425,000 tons.

Small Business:

SDPA's Taylor says small firms must get larger slice of war work pie.

Small business must be given a greater share in the nation's defense production program to satisfy congressional demands concerning mobilization efforts.

This view has been expressed by Small Defense Plants Administrator Telford Taylor in a letter to Defense Secretary Robert Lovett.

Ripe for Changes—The SDPA chief, who sent copies of the document to a number of agencies engaged in contracting, listed six areas in which he recommended joint action between SDPA and other Federal activities. These are:

1. Analysis of the total buying program to establish what can be handled by small business.

2. Exact determination of a "fair proportion" of purchases of supplies and services for small companies.

3. Revision of the "primitive and unsatisfactory" classification of small businesses.

4. Check-ups to insure that more contracts which small firms can handle "are in fact awarded to them"; and encouragement of pooling operations.

5. Procurement and allocation aid to specific branches of industry to alleviate shortages.

6. Coordination and use of current inventories of small business.

STEEL: Warehouse Price Lists Due

Only modest reductions expected under new regulation . . . Some items will increase . . . Local prices to stay competitive . . . Main purpose is to curb speculators—*By E. C. Beaudet.*

Steel warehouses throughout the country were busily engaged this week in computing new ceiling prices under the recently issued Ceiling Price Reg. 98 which becomes effective Dec. 16. Most companies are expected to have their new price lists made up and sent out to the trade before the week is over.

While the new order was hailed as a price rollback, major warehouse prices were expected to undergo only modest reductions. Factors working against a larger decrease are the permitted application of the two latest freight increases and the application of certain current extras which warehouses have been absorbing.

Some Will Rise—Early reports indicated that such items as hot-rolled sheets, structural shapes, hot-rolled bars and plates would be reduced from 5¢ to 10¢ per cwt. Others will go up. Products including galvanized and coated sheets as well as certain specialties would be permitted increases of about 15¢ per hundred.

Although each warehouse is allowed to compute its individual base ceiling on the basis of monthly average material and transportation costs plus a percentage markup by product, prices within each area are not expected to differ greatly, if at all. Competition will force prices to settle at the lowest common denominator for each product.

While prices are to be recalculated each month, some sources believe price changes won't be made so long as they remain within the ceiling.

Brokers Out—Main purpose of the order is to curb high prices charged by finders, brokers, and distributors. Distributors report they will still be able to operate profitably but at a greatly reduced volume. Buying of excess stocks from manufacturers will fall off substantially. Steel imports will be picked up wherever possible to make up for this loss.

Order is expected to cut out everyone who does not have his own warehouse. Only way around this seems to be the selling of steel by brokers to warehouses on a commission basis as long as the ceilings are kept. Already, some quarters formerly engaged solely in buying mill seconds and upgrading them to primes and selling them at above warehouse prices, are said to be forced out of business.

Hard to Figure—Computation of ceilings by districts is more complicated than by warehouses. Constant fluctuations in tonnage, price, and transportation costs make the job more difficult. Also there is the question of whose extras to apply in such situations.

Some feel the regulation calling for holders of excess stocks to report surpluses to National Production Authority before selling them coupled with the new price order will be conducive to more hiding and black market selling. Few manufacturers are eager to make surpluses known for fear they will be cut down in allotments when they may need all they can get at a future date to maintain production.

"No, I'm not exactly jealous of supply and demand, but . . ."

Field Offices May Set Ceilings

Field establishments of Office of Price Stabilization now have authority, delegated by Washington headquarters, to issue letter orders establishing ceiling prices for individual applicants.

This power, outlined in Delegation of Authority 39, will enable field offices to deal directly with businesses applying for Capehart amendment adjustments permitted under recently-issued General Overriding Reg. 21. The delegation was directed to regional directors of OPS, but the latter can redelegate to district offices. GOR 21, which became effective Dec. 5, is the order under which most producers, manufacturers, and processors have the option of applying for ceiling price changes that will reflect higher costs up to July 26, 1951.

Industry Controls This Week:

OPS Orders

Delegation of Authority 39—Permits OPS field officers to establish ceiling prices for individual applicants.

GCPR, Supplementary Reg. 81—Allows automotive and aircraft producers to round prices when compensating for excise taxes.

CPR 1, Revision 1, Supplementary Reg. 1—Grants passenger car producers optional price adjustments to cover increased costs.

CPR 22, Amend. 1, Revision 1, Supplementary Reg. 2—Sets new method for figuring overhead cost adjustment.

CPR 30, Amend. 22—Allows manufacturers to reflect excise tax changes in disposing of inventory.

CPR 67, Amend. 4—Establishes method for machinery resellers for determining pre-Korean percentage markups.

CPR 100—Sets new retail prices for farm equipment.

Some Will Get Extra CMP Quotas

Supplemental allotments of controlled materials are now available to "a small number of producers" for first quarter production.

National Production Authority says the extra rations will be issued only to those producers or manufacturers whose planning has been disproportionately affected by recent reductions of Controlled Materials Plan allotments.

Two types of hardship cases will be considered for supplemental allotments, in addition to those previously receiving such assistance:

(1) Applicants whose original allotments of copper and aluminum for first quarter were at low levels because of substitution possibilities, but who find themselves unable to substitute for reasons beyond their control.

(2) Small "single-line" producers of least essential items who are unable to continue operations under their original allotments of copper and aluminum.

No brass-mill products whatever will be provided, and only small amounts of other materials will be made available for extra helpings, NPA warns.

Will Screen Building Steel Needs

An advisory group consisting of six industry experts, headed by James B. Steep, consulting engineer, of Detroit, has been set up by Defense Production Administration to help improve steel allocation for construction.

Duty of the new committee will be to check all building applications calling for 250 or more tons of steel, beginning with projects lined up for second quarter 1952. Purpose is to make sure requested steel can be used during the quarter for which requested.

Other members of the newly-created group are J. C. Hamilton, assistant to the vice-president, American Bridge Co.; H. J. Hess, contracting engineer, Bethlehem Steel Co.; H. J. Mullin, sales man-

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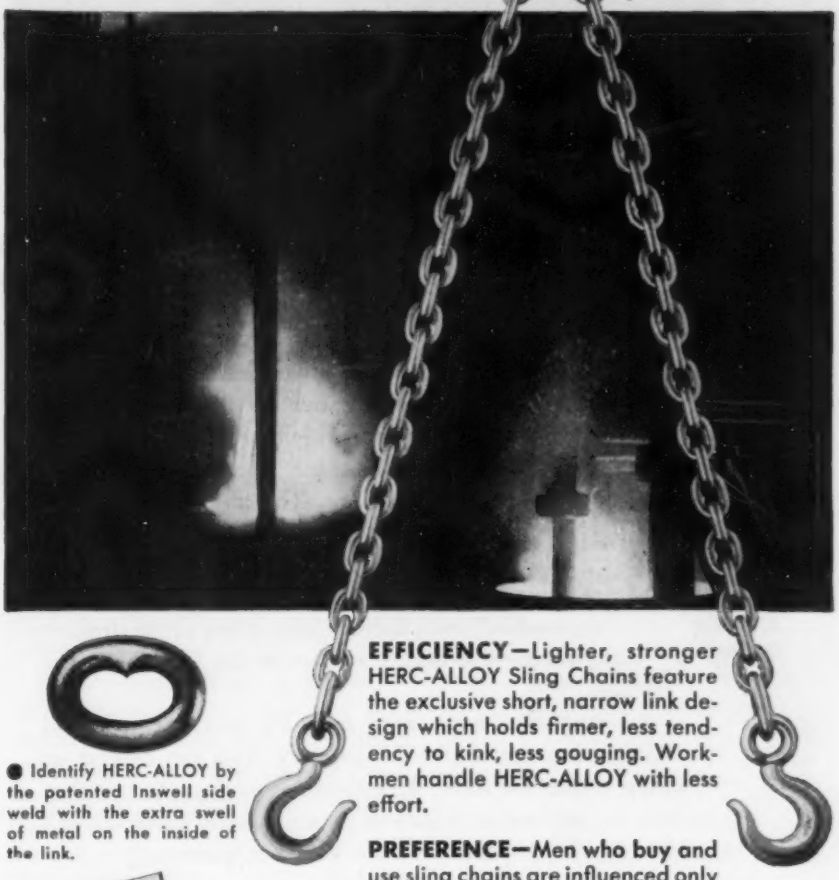

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ager, U. S. Steel Co.; R. E. Wilmot, also of Bethlehem, and Gordon Galloway, assistant Los Angeles district manager, Austin Co.

Need More Hot-Topping Capacity

New hot-rolled bar capacity is expected to be available in third-quarter 1952, but continued heavy demands of the government's machine tool program will continue to outstrip productive capacity, National Production Authority says.

Government officials last week told spokesmen for the cold-finished carbon and alloy bars industry that the heavy military demand for increased production of large-size shells has placed a heavy strain on facilities to turn out high-quality hot-topped steel.

Industry representatives told NPA they have large backlogs on their order books that they are unable to fill, and said the only solution is to increase hot-topping facilities.

Mill Pattern—NPA told the industry it would "see what could be done" to have steel mills give the cold-finished bar industry a mill pattern of the sizes and quality of steel they will be able to deliver at least 120 days prior to the production quarter.

The industry had pointed out that nonintegrated producers of cold-finished bars are required to open their books for orders from their customers 120 days in advance of a specific quarter. The steel mills which furnish them with steel do not open their books for orders until 90 days in advance of the same quarter. Result, it was pointed out, is that the cold-finished bar producers are put in the position of having to accept orders from their customers without knowing whether they will be able to obtain size and quality of steel they need to fill their orders.

NPA stated it was considering taking new action to aid the machine tool industry in obtaining cold-finished bars.

Resellers Get Cost Change O.K.

Resellers of machinery and related goods, pricing under Ceiling Price Reg. 67, now have the go-ahead on obtaining their pre-Korean percentage margins by applying the customary markup to net invoice cost, including manufacturers' excise taxes.

To avoid the confusion of quoting different prices for the same item, resellers may use their current or most recent net invoice cost to determine new ceilings. The resulting prices may be applied to entire resale stocks.

This authority is specified in Amend. 4 to CPR 67, effective Dec. 10. It was issued simultaneously with Amend. 22 to CPR 30, allowing manufacturers to reflect excise tax changes in disposing of inventories. Latter action allows a manufacturer to apply the same ceiling price to all sales of identical items, no matter who actually produced them.

Parts Price-Rounding Rules Set

Producers of automotive or aircraft parts, accessories, or equipment, pricing under the General Ceiling Price Reg., now may round ceiling figures to the nearest cent or fraction of a cent in reflecting changes in excise taxes.

The authorizing order, Supplementary Reg. 81 to the GCPR, also permits rounding of ceiling prices to the nearest nickel for price-list items customarily sold at established discounts. Rounding, Office of Price Stabilization says, must show decreases as well as increases.

"A" & "B" Magnet Status Defined

Magnet manufacturers now are able to determine the "A" or "B" product status of their output, for purposes of obtaining controlled materials for second quarter 1952 production.

National Production Authority recently gave the category breakdown to members of the permanent magnet manufacturers' industry advisory committee. The agency said that:

1. Magnets drawn, rolled, or formed from alloy steel ingot

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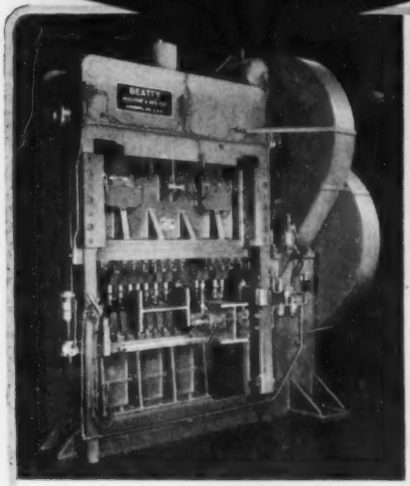
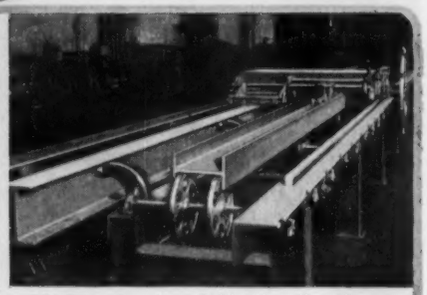
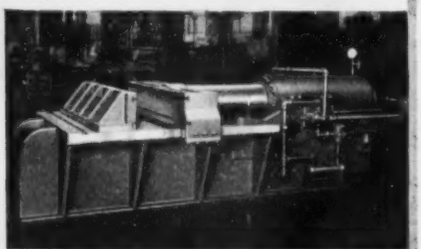


BEATTY No. 9 Guillotine Beam Punch for flange and web punching of beams up to 30"



BEATTY Spacing Table handles flange and web punching of beams without roll adjustment.



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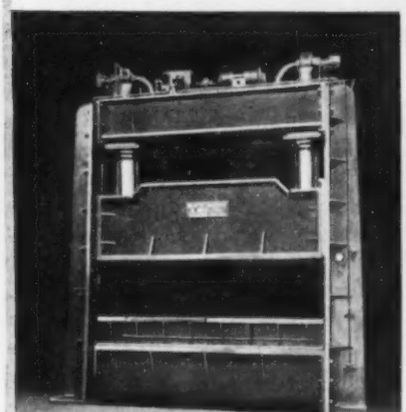
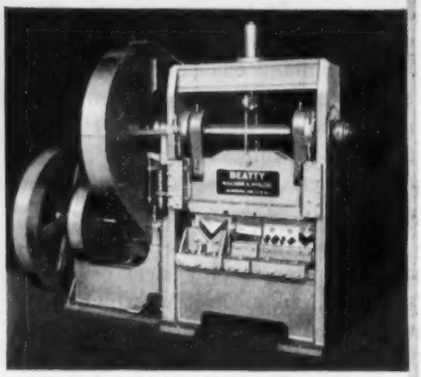


BEATTY 400-ton Hydraulic Vertical Bulldozer for heavy forming and pressing.



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into wire, bar, or rod shapes will be considered controlled-materials products.

2. Magnets cast to shape or powdered will be "B" products. Manufacturers will file monthly for allocations of cobalt and nickel or molybdenum from NPA iron and steel division. They also will file a CMP Form 4-B with general components division for a quarterly allotment of new or scrap iron, copper powder, and brass mill products.

3. Magnets produced for specific end-uses by customers with specialized requirements are "A" products, and customers must apply for component materials.

May Ease Fuse Priority Order

A proposed amendment to ease the requirement that electric fuse manufacturers give all rated orders priority over nonrated orders is contemplated by NPA.

Industry representatives have examined the proposed change, which would require producers to deliver only those orders rated A, B, or C by the Defense Dept., or E by the Atomic Energy Commission. Spokesmen for the manufacturers have approved the proposal, with the understanding that the quantity of controlled materials would not be reduced.

Fear Shortage — The industry group had told NPA it feared that allotments of controlled materials for first quarter of 1952 will cause a shortage of fuse production and hamper industrial expansion.

Allotments include 100 pct of stated requirements for military orders, screened to 90 pct of original estimates. For nonmilitary orders, percentage of base period usage of controlled items was 60 pct of screened requirements for copper products, 63 pct for steel, and 72 pct for aluminum.

The level of production permitted is forecast as slightly below the fourth quarter 1951 level.

NPA, however, reiterates that there is no immediate prospect of additional supplies of two critical items—copper and zinc.

Want Brass Mill Order Changes

Brass-mill products distributors are being advised by National Production Authority of several proposed changes in Order M-82.

Revisions, if put into effect, will accomplish the following changes in the industry:

1. Change the definition of distributor and other applicable provisions of the regulation to include distributors who buy from other distributors as well as those who buy from mills only.

2. Clarify provisions of the order dealing with direct mill shipments to customers. Such orders would then be identified by order numbers, date of placement, allotment numbers and symbols, and the name and address of the customer.

3. Permit distributors to accept authorized controlled materials (ACM) orders only.

4. Require the maintenance of records of all transactions made under the proposed order for at least 3 years, instead of the 2-year period of the present order.

Industry is urging NPA to permit greater flexibility in placement of orders. They say present limitations on acceptance of orders, as set forth in M-82, are impracticable, since they interfere with normal business operations.

New Method for Cost Adjustment

An overhead adjustment percentage for the entire product line can be figured directly by manufacturers pricing under Ceiling Price Reg. 22, who formerly were required to calculate individual dollars-and-cents adjustments for each item produced.

This optional time-saving operation is authorized by Amend. 1 to Revision 1, Supplementary Reg. 2, CPR 22. Addition of the overhead cost adjustment method, described in Rev. 1 to SR2, is the only important change made in SR2 since the original regulation was issued May 28.

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Contracts Reported Last Week

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Engine cylinder thermometer indicators, 1305, $31,167, The Lewis Engr. Co., Naugatuck, Conn.

Accelerometers, 1960, $151,500, Seth Thomas, Thomaston, Conn.

Hack saws, 15, $41,493, Peerless Machine Co., Racine, Wis.

Turret lathes, 7, exceeds $250,000, Gisholt Machine Co., Madison, Wis.

Navy type, welded steel Sonar domes, 100, $178,530, Charles T. Brandt Co., Baltimore.

Tubeaxial and Vaneaxial fans, 408, $127,364, Joy Mfg. Co., Pittsburgh.

Power signal generators, 10, $33,425, The Rollin Co., Pasadena, Calif.

Motors, 29, $32,346, Miehle Printing Press & Mfg. Co., Bloomfield, N. J.

10 air compressor units, 32, $84,002, Worthington Pump & Machinery Corp., Harrison, N. J.

Blowers, centrifugal, 176, $167,503, ILG Electric Ventilating Co., Chicago.

Machines, automatic, for inspecting firing pin assy., 25 ea, $135,835, Electric Eye Equip. Co., Danville, Ill.

Training Bearing Assys, 100 sts, $47,195, The Torrington Co., Bantam Bearings Div., South Bend, Ind.

Relay, 1725 ea, $10,332, C. P. Clare and Co., Chicago.

Spare parts for tractors, exceeds $250,000, Caterpillar Tractor Co., Peoria, Ill.

Breech ring forgings, exceeds $250,000, York Corp., York, Pa.

Mandrels, lathe, 720, $69,497, The Western Tool & Mfg. Co., Inc., Springfield, Ohio.

Primer Screw assy, $54,887, H & H Mfg. Co., Buffalo.

Booster, exceeds $250,000, Royal Typewriter, Hartford.

Drills, portable electric, 2205, $49,995, Milwaukee Electric Tool Corp., Milwaukee.

Initiator Burster, T-for Shell, Smoke, W. P. M238, 8900 units, $204,700, Harvey Machine Co., Los Angeles.

Coupling, flexible, 65160 ea, $62,628, American Radio Hardware Co., Mt. Vernon, N. Y.

Rectifier, power supply, 2168 ea, $36,771, Bright Radio Laboratories, Long Island, N. Y.

Radio set, exceeds $250,000, Emerson Radio & Phonograph, New York.

Gaskets, 463492 ea, $42,100, Linear Inc., Philadelphia.

Radio set, exceeds $250,000, Motorola Inc., Chicago.

Radio set, exceeds $250,000, Radio Corp. of America, Camden, N. J.

Battery pack, 37503 ea, $175,139, Specialty Battery Co., Madison, Wis.

Starter, Star Delta, 260, $29,315, Allen-Bradley Co., New York.

Photoelectric trigger circuits, 30, $29,550, Potter Instrument Co., Great Neck, N. Y.

Box, starter assy, 150, $31,402, Newark Boiler Regulator Co., Inc., Bloomfield, N. J.

Repair parts for pumps, exceeds $250,000, Warren Steam Pump Co., Inc., Warren, Mass.

Repair parts for steam turbines, 422, $31,425, Allis-Chalmers Mfg. Co., Milwaukee.

Telescope Mts., 3 ea, $158,772, Builders Iron Fdry, Providence.

Assys, drive, variable speed, 1 st, $173,756, Buel Machine Co., Woburn, Mass.

Cups, bullet jacket, lbs, $34,066, Superior Steel Corp., Carnegie, Pa.

Machine, Meat Slicing, 40 ea, $44,280, U. S. Slicing Machine Co., Inc., La Ported, Ind.

Vegetable Peeling Machine, 252 ea, $74,088, Gifford-Wood Co., Hudson, N. Y.

Truck, Utility Kitchen, 373, $40,341, Tyler Fixture Corp., Niles, Mich.

Forceps, Hemostatic Straight, 15840, $34,698, American Medical Instr. Corp., New York.

Fuze, bomb, exceeds $250,000, Bayshore Industries, Inc., Elkton, Md.

Replenishment of Tank & Combat Vehicle Parts, 10085, $54,147, Federal Mogul Corp., Coldwater, Mich.

Batteries, 7655 ea, $144,756, GMC., United Motors Service Div., Detroit.

Replenishment of Hardware, 55,185, $29,001, Bower Roller Bearing Co., Detroit.

Spark Plugs, 270,000 ea, $78,570, Auburn Spark Plug Co., Auburn, N. Y.

Replenishment of other Motor Vehicle Parts, 125,000 ea, $71,250, American Auto Parts Co., Kansas City.

Batteries, exceeds $250,000, Gould National Batteries, St. Paul, Minn.

Replenishment of Tank and Combat Vehicle Parts, exceeds $250,000, Lipe-Rollway Corp., Syracuse, N. Y.

Extractor, 3000, $15,442, Apex Tool & Machine, Indianapolis.

Government Inviting Bids

Latest proposed Federal Procurements, listed by item, quantity, invitation, No. or proposal, and opening date. (Invitations for Bids numbers are followed by "B," requests for proposals or quotations by "Q").

Ordnance Tank Automotive Center Detroit

Pin, cotter, split steel, 1560000, 52-805B, Dec. 27.
Pin, cotter, brass, 50000, 52-805B, Dec. 27.
Pin, cotter, split steel, 320000, 52-805B, Dec. 27.
Pin, straight, chamfered steel, 5000, 52-805B, Dec. 27.
Pin, taper, steel, cold rolled plain finish, 40000, 52-805B, Dec. 27.
Bearing, ball, 5300, 52-607B, Dec. 27.
Body trailer, 350, 52-658B, Dec. 27.
Kit, repair, 6882, 52-645B, Dec. 28.
Rod, fuel pump, 120, 52-716B, Dec. 28.
Guard, fuel tank, w/support and lining assy, 330, 52-716B, Dec. 28.
Lining, fuel tank, guard support, 900, Dec. 28.
Strap, fuel tank guard, 525, 52-716B, Dec. 28.
Panel, instr assy, 140, 52-716B, Dec. 28.
Tray, battery assy, 175, 52-716B, Dec. 28.
Plate, dash, wiring harness grommet, 350, 52-716B, Dec. 28.
Bracket trailer light, 140, 52-716B, Dec. 28.
Bracket, mounting, 70, 52-716B, Dec. 28.
Shield, generator, 350, 52-716B, Dec. 28.
Shield, fuel tank, 85, 52-716B, Dec. 28.
Brace, fuel tank guard, 140, 52-716B, Dec. 28.
Nut, gland, 22000, 52-657B, Dec. 28.
Receptacle, oil cooler fan, 175, 52-697B, Dec. 28.
Switch, gun firing tur, 1000, 52-697B, Dec. 28.
Horn assy/includes bolts/, 10000, 52-559B, Dec. 28.
Nut, hex., 750000, 52-804B, Dec. 28.
Nut, castle, 580000, Dec. 28.
Nut, jam, hex, semi-fin., reg., alloy steel, 268600, 52-804B, Dec. 28.
Nut, machine, screw, hex., 390000, 52-804B, Dec. 28.

Watertown Arsenal, Watertown, Mass.

Pump, hydraulic, 2 ea, 118B, Dec. 28.

Navy Purchasing Office, Washington

Projector, fuse, 250000, 56420-B, Jan. 8.
Trucks, fork, left, 257, 2405-Q, Dec. 28.

Corps of Engineers, St. Louis.

Bolt, track, steel, 1350 kgs, (ENG-23-065-52-401B), Dec. 17.
Bolt, plow, steel, nc, round head, sq. neck, 200000 ea, (ENG-23-065-52-401B), Dec. 18.
Bolt, stud, steel, nc, 8¾ in. length, 10 threads per in., 1000 ea, (ENG-23-065-52-401B), Dec. 18.

Aviation Supply Office, Philadelphia

Screw, various types and sizes, 40981 gr, (383 2280 1128 52 Q), Dec. 17.
Machine cutting, GAS, 18 ea, 52-401B, Dec. 18.
Saw band and saw scroll, 329 ea, 52-428B, Dec. 19.
Reflector assy, 5000 ea, 52-432B, Dec. 19.
Mount assy, gun, 600 ea, 52-5269Q, Dec. 17.
Indicator, airspeed, 1 itm, 52-5342Q, Jan. 2.
Engine mounts, 5 itm, 52-5365Q, Jan. 2.

New York Chemical Procurement District, New York

Cylinder, ignition, portable, flamethrower, 887478 ea, CML-30-070-52-30 B, Dec. 27.

Signal Corps Procurement Agency, Philadelphia

Assy, consists of speaker driver unit horn and stand, 270 ea, 11504-02-Q, Jan. 2.

Watervliet Arsenal, Watervliet, New York

Chamber, evacuator, assembled, 1000 ea, 52-51 B, Jan. 3.
Gear shapers, 1 or, 29839, Dec. 27.

General Services Administration, Washington

Vises, machinist, 144 ea, 3K-5068-R, Dec. 20.
Vises, pipe, 144 ea, 3K-5068-R, Dec. 20.
Screwdrivers, 4346 ea, 3K-4964-R, Dec. 19.

General Services Administration, Chicago

Refrigerators, 258 ea, CHD-1012, Dec. 26.
Lamps, portable, fluorescent, 130 ea, WCH-35780, Dec. 21.

Atomic Energy Commission, Oak Ridge, Tenn.

Miscellaneous Equip, 1 lot, Dec. 13.

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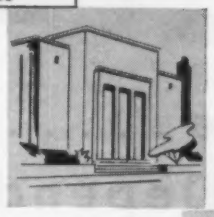

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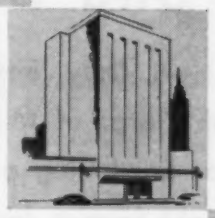

Office Buildings

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DISTRICT OFFICES

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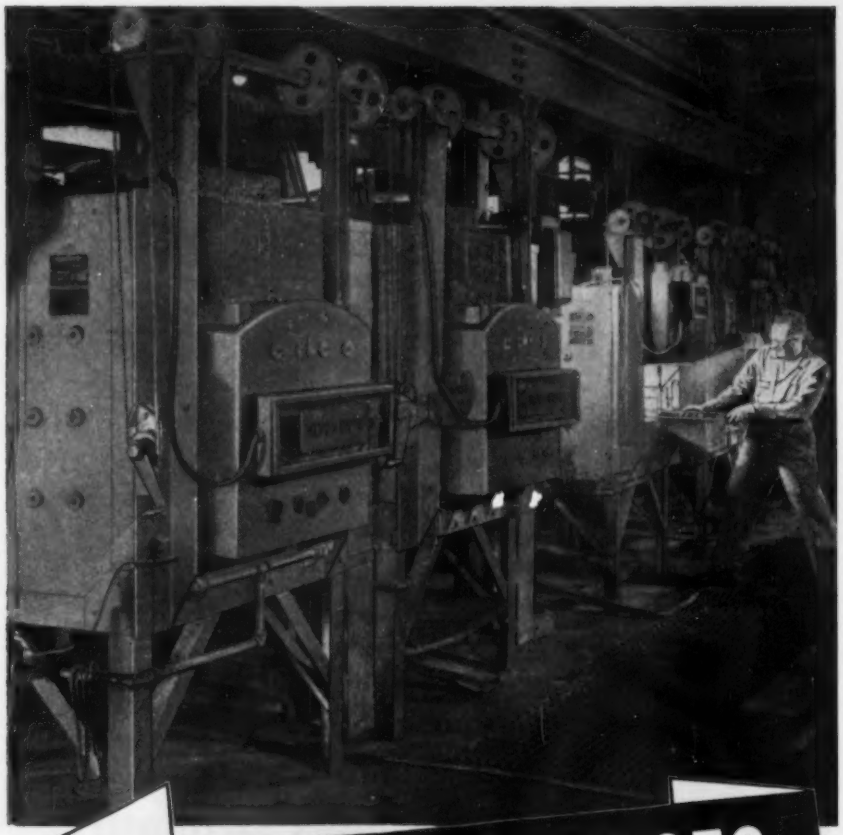

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Steel Inquiries and Awards

Fabricated Steel Awards this week include the following:

15,000 Tons, Lake Andes, S. D., Penn Stocks to Pittsburgh-Des Moines Steel Co.

2660 Tons, Chicago, Congress St. Bascule Bridge, to American Bridge Co.

770 Tons, Philadelphia, extension of Market St. Subway, to Bethlehem Steel Co., Bethlehem.

475 Tons, Philadelphia, two tanks at Philadelphia Refinery of Atlantic Refining Co., to Hammond Iron Works, Bristol, Pa.

475 Tons, Nazareth, Pa., galvanized transmission towers for Pennsylvania Power and Light Co., to Lehigh Structural Steel Co., Allentown, Pa.

220 Tons, Philadelphia, 30-in. pressure pipe for city water system, M. & J. B. McHugh, general contractors, to Bethlehem Steel Co., Bethlehem.

108 Tons, Escambia County, Alabama, beam bridge, Alabama State Highway Dept., to Virginia Bridge Co., Birmingham.

Fabricated Steel Inquiries this week include the following:

3115 Tons, Montgomery County, Pa., construction of divided highway, 7 retaining walls, slab bridge, plate girder bridge, and one I-beam bridge, Pennsylvania State Dept. of Highways, Harrisburg, Pa. Bids to Dec. 20.

1100 Tons, Bucks County, Pa., highway bridge for Pennsylvania State Dept. of Highways. Bids due Dec. 14, 1951.

320 Tons, Crawford County, Pa., one slab bridge and one I-beam bridge, Pennsylvania Dept. of Highways, Harrisburg, Pa. Bids to Dec. 20, 1951.

108 Tons, Schuylkill County, Pa., highway bridge for Pennsylvania State Dept. of Highways. Bids due Dec. 14, 1951.

Reinforcing Bar Awards this week include the following:

775 Tons, Chicago, Chicago Dwelling Association, Project No. 1, to Bethlehem Steel Co.

700 Tons, Clairton, Pa., byproduct coke plant to U. S. Steel Supply Co.

400 Tons, Hinsdale, Ill., Sanitorium and Hospital to Ceco Steel Products Co.

Reinforcing Bar Inquiries this week include the following:

704 Tons, Montgomery County, Pa., construction of divided highway, 7 retaining walls, slab bridge, plate girder bridge and one I-beam bridge, Pennsylvania Dept. of Highways, Harrisburg, Pa. Bids to Dec. 20, 1951.

700 Tons, Elrama, Pa., Duquesne Light Co.

285 Tons, Beardston, Ill., bridge.

220 Tons, West Virginia, chemical warfare.

175 Tons, Chicago, Mazel House Addition, Edgewater Hospital.

155 Tons, Cleveland, Cleveland Electric Illuminating Co.

150 Tons, Westchester, Ill., pumping station.

102 Tons, Northumberland County, Pa., build-up and widening of pavement, Pennsylvania Dept. of Highways, Harrisburg, Pa. Bids to Dec. 20, 1951.

100 Tons, Ashtabula, Ohio, Linde Air Products Co.

DPA Divides the Steel Production Pie

Military to get 20 pct in first quarter, defense-supporting industry, 22 pct, civilian plants, 58 pct . . . War spending can top budget . . . Shortchanged on nickel?—*By G. W. Baker.*

Twenty pct of steel output to strict military production.

Twenty-two pct to defense-supporting production.

Fifty-eight pct to civilian production.

These figures are now official for first quarter output of the nation's steel mills.

Defense Production Administration, in making these general allotments public last week, is taking an attitude of indifference toward the howls of protest from manufacturers of civilian-type goods. Agency officials point out that they've warned repeatedly in recent months of the coming clamp-down. (See next page for civilian output story.)

Faulty Distribution—Nevertheless, they're quietly examining charges of "faulty distribution" raised last week before the Senate Small Business Committee by spokesmen for two steel-producing firms.

Both David F. Austin, U. S. Steel Corp., and J. V. Honeycutt, Bethlehem Steel Corp., told the committee, in effect, that poor distribution judgment—not underproduction—is the real weakness in lagging military production schedules.

Estimate's Way Up—As for aluminum, DPA is planning to divide up first quarter production in this manner: 45 pct to military production, 15 pct to defense-supporting production, and 40 pct to civilian usage.

This is being contrasted in some government circles with the statement issued last spring by Defense Mobilizer Charles E. Wilson to the effect that military requirements would amount to only about 25 pct of supplies.

Not Restrictive—Defense Secretary Lovett's statement that the Pentagon is thinking in terms of a $45,000,000,000 budget for fiscal 1953 should not be interpreted as an indication that the military plans to confine its spending to this reduced figure.

Actually, this amount is privately regarded in top-level planning offices as "only a starting point." True, this sum does include provision for expansion of the Air Force from 95 to 143 wings, but size of a number of yet-to-be-determined Army and Navy programs can easily run the $45 billion figure away beyond this year's record $59,400,000,000 military budget.

Lovett says he feels there is an urgency that requires the nation to use its very best efforts in rearming. As a result, he is anxious to avoid being pinned down at this state as to the prospective size of the '53 military spending program.

"Sorry, Chester, not enough inconsistencies in this order. We won't be able to call any IAC meetings if it goes through like this."

Bad Deal on Nickel—An NPA official let it be known last week that global division of the world's scarce materials is beginning to crimp some U. S. production.

Harry J. Holbrook, director of NPA's Consumer Goods Div., says it now appears that the U. S. will get only about 65 pct of the world nickel supply under the "one-world" allocation plan that became effective Oct. 1.

Prior to Oct. 1, the U. S. received about 70 pct of the world supply from Canada alone. Canada produces about 85 pct of the world supply.

Won't Meet Demand—Even with increased production in Cuba and in Canada, Holbrook says, domestic demand for the scarce product will not be filled.

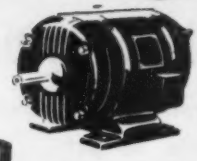
Jet-plant production and other military orders have top priority on the limited supplies, which means that manufacturers of cooking and heating appliances and housewares again will be forced to find substitute materials.

Contract Probe? — Munitions Board's disclosure that 100 large firms received 61.5 pct of all military prime contracts in fiscal 1951 is being studied by the Senate Small Business Committee with a view to possible public inquiry.

Committee members are known to be far from satisfied with this percentage, and particularly with the announcement that the first eight firms on the Munitions Board list received 25.6 pct of the military prime contract dollar volume for the fiscal year.

An ever-increasing number of manufacturers of • Jet aircraft engines

• Electric motors & generators



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120 DIETZ ROAD

DPA: Estimates Civilian Output

Agency lists tentative levels of permitted production for non-defense goods . . . Machine tools, bearings are limited only by ability to produce . . . Changes in second quarter.

Defense Production Administration last week released estimates on the level of permitted production of civilian-type goods in the first and second quarters of 1952. Estimates are in terms of percentages of industry base period output.

Automobiles—First quarter, 58 pct. Second-quarter figure is still undecided, but it will be somewhere between 50 and 58 pct.

Farm Implements—First quarter, 115 pct. Not much change is expected for the second quarter.

Machine Tools—Better than 200 pct for the first quarter. Industry is limited only by its ability to consume materials. The same will apply for second quarter.

Hand Tools, Other Than Metal Cutting—No figures available at press time. DPA says it is a problem of selection. Output of tools for production will be pushed, but cut-backs are planned for household-type tools, including hobby tools and cheaper drills.

Shipbuilding—Figures on ocean-going ships are so far unavailable. As far as Great Lakes ships are concerned, first quarter production will be 100 pct of stated requirements. No change is expected for second quarter.

Barge production in the first quarter will be at 25 pct of stated requirements. DPA says unofficially this will have to be increased in second quarter to keep the industry alive. The agency made no comment on how much of an increase will be needed.

Bearings, Antifriction — First quarter, 150 pct. DPA warns, however, that this is a "very rough" estimate of production.

Generally speaking, the bearings industry will, like the machine tool industry, be limited only by its ability to use materials.

Mining and Oil-Well Drilling—These are taken together by DPA. Oil will be at 100 pct or better. No estimate on mining, except the statement that "some increases will be permitted."

Fuel:

DSFA approves increasing coke and metallurgical coal output.

Controlled-materials allocations for $190,536,708 worth of new coke-oven construction now have been fixed for first quarter 1952.

Defense Solid Fuels Administration, in announcing the allocations for 39 coke-oven and coal-chemical construction projects, said first quarter construction in this field will constitute one of the largest coke-oven building programs in history.

But a large part of the 8,395,000 tons in new capacity will merely replace old ovens which are being retired. SFA predicts that the nation will lose coke capacity of about 3,500,000 tons a year for the next few years as a result of retirements. Nearly half of all ovens now operating are more than 25 years old.

Coal, Too — DSFA also announced approval of 29 projects in eight states for the increased production of metallurgical coal. Approved projects will total about $48 million.

Steel industry expansion is expected to increase the demand for metallurgical coal to about 120 million tons by the end of 1952, an increase of about 17 million tons over the 1950 consumption rate, according to DSFA.

Over-all increase in U. S. metallurgical coal capacity as the result of the new projects approved through Nov. 30, 1951, is estimated at about 9,231,000 tons. Projects approved in Pennsylvania will add about 4,213,000 tons to the nation's capacity. Alabama projects will contribute 1,080,000 tons; projects in Kentucky, Virginia, and West Virginia, 2,033,000 tons; and projects in states west of the Mississippi, 1,905,000 tons.

Halt Set-Off Practice?

No government regulations will be required to abolish the set-off practice in defense contracting, if prime contractors continue to show willingness to drop the procedure voluntarily.

Small Defense Plants Administrator Telford Taylor makes this prediction on the basis of early answers from companies contracted on the set-off question. Defense Dept., the contacting agency, recently sent some 600 letters to prime contractors and major subcontractors, recommending elimination of the practice.

Replies from approximately 100 of these firms were said to show a general agreement with the recommendation.

Latest Government Appointments

Washington has recently announced the following appointments in defense and related agencies:

John M. Carmody, engineering consultant, Small Defense Plants Administration;

George A. Grimm, chief, Utilities & Fuels Div., Munitions;

E. A. Harris, deputy director, Rubber Div., NPA;

E. D. Kelly, director, Rubber Div., NPA;

Wesley S. Walker, director, General Industrial Equopment Div., National Production Authority;

Walter H. Wiewel, director, Metals & Minerals Bureau, NPA.

Industrial Briefs

Authorization—Stockholders of ALLEGHENY LUDLUM STEEL CORP. have authorized an increase in company indebtedness from $20 million to $40 million. The company has no present intention of increasing indebtedness beyond $27.2 million. An overall $80 million expansion program is nearing completion, and it may be necessary to borrow $13 million in 1952 on top of current funded debts aggregating $14.2 million.

Expansion Program—CATERPILLAR TRACTOR CO. has embarked on an expansion which will include a new factory in York, Pa., and additions and improvements to plants in Joliet and Peoria, Ill. Major portion of the program will be financed with a long term loan of $35 million.

Organizational Change—Designed to create and develop original ideas and techniques that will benefit the nation's consumers, canners and farmers, AMERICAN CAN CO. has established a new Research and Technical Service Department. The department consists of the Research, Development, Technical Service and Agronomy divisions.

Employment Center — TENNESSEE COAL, IRON & RAILROAD CO. has opened its new 2-story employment center at Fairfield, Ala. The building houses the central employment agency for Fairfield Steel works, sheet and tin mills, wire works and by-products coke plant.

Construction Contract — AVERY CORP. has awarded engineering and construction contracts to H. K. Ferguson Co., for an expansion program that will double the output of its chlorine and caustic soda plant at Memphis. Estimated cost—$2 million.

In Production—HENRY & MILLER INDUSTRIES, INC., recently opened a new metal fabrication and finishing plant in Jersey City. The plant, which began production in October, will be in full-scale operation early in January.

Larger Quarters — JOHNSON MACHINERY CO. has moved to more spacious quarters located at 683 Frelinghuysen Ave., Newark, N. J.

Being Built—Additional factory manufacturing space is now being built by the SHEPHERD SPECIAL MACHINE & DIE CO., Cleveland. The company has purchased the plant property at 15215 Chatfield Ave.

New Wing—Construction of a new wing to house two new research laboratories has been completed by EUTECTIC WELDING ALLOYS CORP., Flushing, N. Y.

President Elected—William I. Burt, vice-president—manufacturing, of B. F. GOODRICH CHEMICAL CO., Cleveland, has been elected president of the American Institute of Chemical Engineers for 1952.

Changes Name — Dominion Foils (Canada) Ltd., at a recent meeting of the board of directors, decided to adopt a new name, ALUMINUM ROLLING MILLS, LTD., the new name being more descriptive of the company's operations.

Relocated — HYDRAULIC PRESS MFG. CO. has moved its Chicago office to 3058 Peterson Bldg., Peterson Ave. The office was formerly located at 201 N. Wells St.

"I must have dozed off—when did HE start talking."

Consolidated—The export operations of BARLOCK PACKING CO. have been consolidated and the New York office has been made headquarters of this division. The division moved to new offices at 30 Church St.

Jelliff Appointment—C. O. JELLIFF MFG. CORP. has appointed the Pennsylvania Industrial Supplies Co., Inc. their sole representatives in the Pittsburgh area for all products except electrical resistance wire.

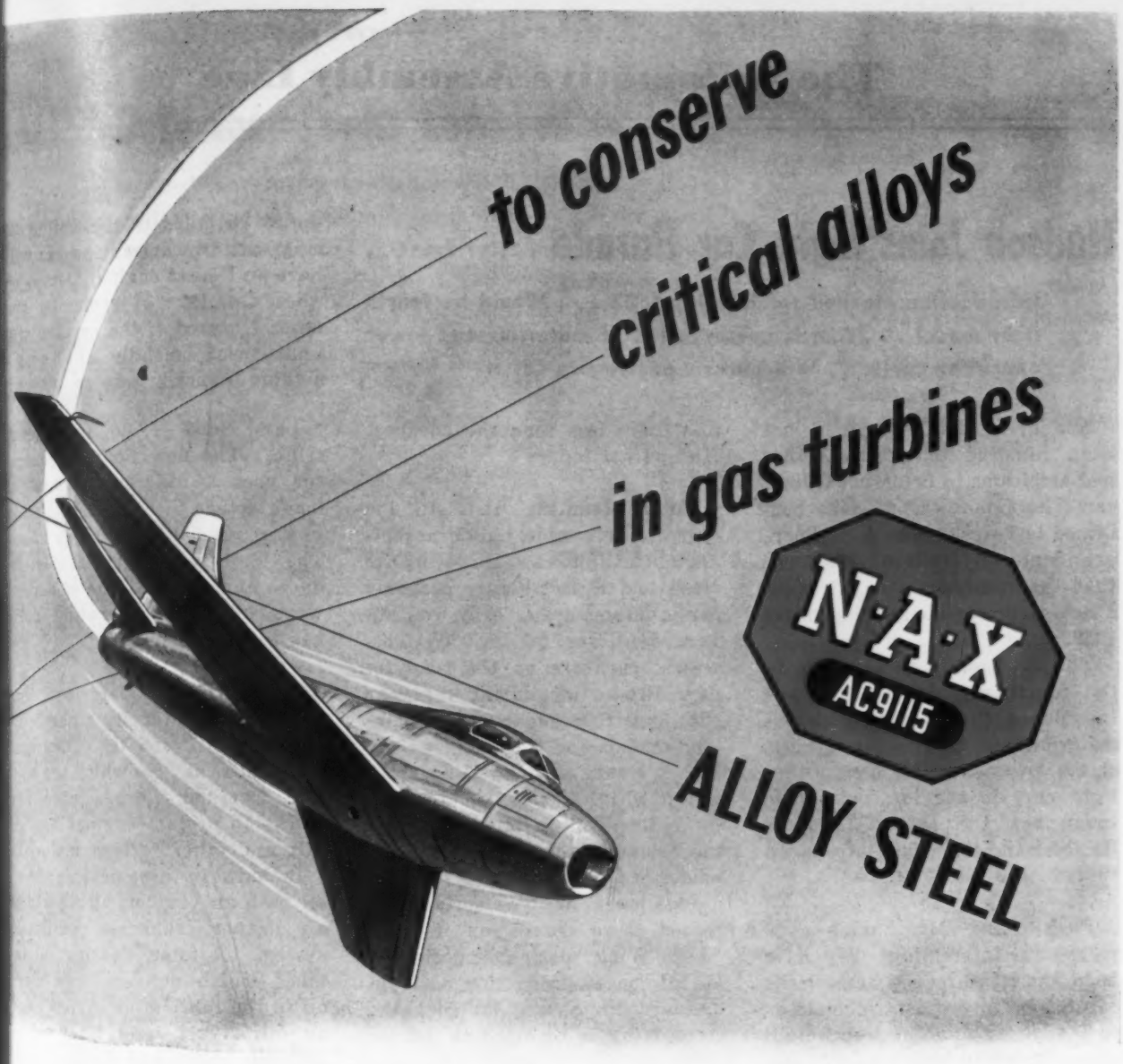
Purchases Plant—York Engineering & Construction Co. has purchased the plant and manufacturing facilities of the Gillespie Mfg. Co., Pittsburgh. The YORK-GILLESPIE MFG. CO. has been formed to operate the plant.

Announcement—The first courses in instrument maintenance and repair to be held in 1952 by the Brown Instruments Div. of MINNEAPOLIS-HONEYWELL REGULATOR CO. will start on Jan. 7. They will be held at the Brown School at Philadelphia.

Kiln Contract—PIOCHE MANGANESE CO., subsidiary of Combined Metals Reduction Co., has awarded a contract to Standard Steel Corp. for the construction of a large rotary kiln to be erected at Pioche, Nev. The kiln will be 175-ft long and 9 ft in diameter and will be used to process manganese dioxide ore.

Frasse Opening—PETER A. FRASSE & CO., INC., held opening ceremonies at their new office and warehouse building recently completed on Court Street Road in Syracuse, N. Y. The entire Frasse Syracuse operation is under one roof which is devoted to the distribution of alloy, stainless and cold-finished carbon steels and tubing in that area.

Contracts Awarded—PITTSBURGH STEEL CO. has awarded the following contracts: Westinghouse Electric Corp., main drive and auxiliary equipment for its 4-stand tandem cold reduction mill; General Electric Co., cold temper mill drive; Aetna-Standard Mfg. Co., two cold-rolled sheet shearing lines; Elliott Co., electrical equipment for hot-rolled shearing line.



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Hudson Joins Light Car Parade

Introduction planned for middle of '52 . . . Would be fourth light model . . . Aim is conservation of materials and lower operating costs . . . Will seat six passengers—*By W. G. Patton.*

For more than a year it has been rumored that Hudson has had ambitions to bring out a light car. This report was officially confirmed last week when A. E. Barit, president of Hudson, disclosed that the company will introduce a new light car about midsummer 1952.

The Hudson light car will be the fourth model developed and introduced thus far to conserve materials and keep motoring costs at the lowest possible level. Other light cars in the low price field today are the Henry J., Nash Rambler and the newly-introduced Willys Aero Car.

Push Plans—Mr. Barit's comments are interesting: "We have been impressed by the suggestions of certain government officials as to the desirability of lightweight cars which will help conserve materials. Therefore, we have decided to push to completion our production plans for a light car which we have had under development for a considerable period of time. In producing this car we will use existing facilities."

Reports from the trade indicate that a number of dies required for the new car have already been completed. It is apparent that Hudson officials feel Washington intends (1) to restrict the amount of material that may be used in a car, (2) curb total material allocations still further.

Details of the new Hudson are scarce. The car will be a new model. It will be much lighter than the present Hudson. The car will carry up to six people. It will be step-down design. The car will be designed "to sell for hundreds of dollars less than the cheapest Hudson car today."

Totals Mounting—It is still too early to determine public acceptance of a light car. However, the Nash and Kaiser-Frazer economy car programs are already well advanced. Close to 150,000 lightweight cars are on the road today. Production during the year 1951 is estimated at 60,000 Rambler models for Nash and nearly 55,000 Henry J's for K-F. This group will be joined in January by Willys and in midsummer by the new Hudson light-weight model.

Last week, Willys-Overland released more details on its new "Aero Wing" design, expected to go into mass production early in January. Using regular fuel, the Aero Wing is reported to deliver up to 35 miles to the gal at 30 mph with overdrive. The car will have an F-head engine. Details on wheelbase, type of springing and other features of the car are still undisclosed officially although nothing radically new is planned.

SOLAR CONTROL: All 1952 autos of makers supplied by Pittsburgh Plate Glass Co. will be equipped with Solex (at right). Iron in the glass absorbs most of solar infrared and ultraviolet rays but lets soft light through for clear vision. Glass also protects fabrics from fading.

Less Noise—Add tremendous trifles: The new Pontiac generator uses a different method of manufacture in order to maintain greater precision in its gap space. The improvement noticeably reduces hum. This is one of several ways in which operating noise has been reduced.

Anti-Dirt—Chrysler Corp. has published an interesting new booklet, *Engine Protection*, describing the various devices which are built into Chrysler Corp.'s cars and trucks to protect engines against dirt and other foreign materials.

Included in these devices are an oil bath air cleaner, oil filter pipe air cleaner, crankcase ventilation system, oil filter, floating oil intake (which delivers only clean oil to the lubrication system) and an oilite fuel tank filter which prevents water and foreign materials from entering the fuel system.

More Tanks — Production of Walker Bulldog Tanks at Cadillac Cleveland Tank Plant will be increased by 60 pct. With this increase the Ordnance Corps will have placed over $500,000 in orders with Cadillac Cleveland.

It will be several months before the scheduled production boost is achieved. Some several hundred additional skilled and unskilled workers will be needed. Little additional tooling will be necessary, and no plant expansion required.

In order to achieve production increases it is planned to step up second and third shift operations as soon as possible. Material shortages are not expected to hold up the 60 pct boost.

SALES: December Looks Low Too

Would be third consecutive month below 400,000 mark . . . Production will still pass 5 million level in 1951 . . . Hear more reports of market softening . . . Truck sales picture brighter.

December may be the third consecutive month in which passenger car sales failed to reach the 400,000 mark. However, it is a certainty that automobile production this year will pass the 5 million mark.

Reports continue to reach Detroit of market "softening." Detroit financing companies say collections have fallen off sharply in recent months, largely because of layoffs in auto plants.

Forecast—Automobile sales officials are still confident the automobile market is sound. Despite the threat of higher prices and possible car shortages during 1952, no appreciable pickup in auto sales is anticipated during November or December. New model introductions will undoubtedly give January sales a shot-in-the-arm. It is not expected that letters sent out by steel unions to their members urging them not to buy durable consumer goods will have much effect on auto buying.

The truck sales picture is brighter than the passenger car outlook. October may be the best month this year for new truck registrations. Estimated sales totaled 91,000 units. Best previous month, according to *Automotive News*, was May, when 90,627 units were sold.

Wilson Asks More World Output

Making a strong appeal for increasing productivity throughout the world, C. E. Wilson, president of General Motors, last week told the first International Conference of Manufacturers in New York this country has now embarked on a brand new policy. We might call it "colonialism in reverse," Mr. Wilson believes. We are exploiting our own people and our own resources to benefit people in other countries, he explained. This is certainly a new development in the history of the world, he added.

"Even with America's great idealism in productivity, this policy cannot safely be counted on for long by any nation."

Workers Attack Ford Powerhouse

Firing of 26 UAW-CIO members of the Ford Motor Co. of Canada last week led to a mass attack of 80 unionists on the company's powerhouse. Gaining admittance, the workers shut down the generators, plunging the plant into complete darkness.

Pickets promptly ringed all gates to the plant. Automobiles leaving the office were searched, allegedly to prevent removal of company records.

Contract Fight — The latest flareup at Windsor climaxes a 6-month dispute over the new Ford-Canada contract. Union officials admit the walkout was unauthorized.

Included in the list of 26 employees discharged by management were nine union stewards and four shop committeemen.

Ford Sets Up Staff Policy Board

Ford Motor Co. has set up a new 5-man engineering board for formulating staff policy. Six new department heads have been appointed. B. Y. Tallberg has been named executive engineer, administration. R. F. Kohr becomes executive engineer, general engineering. The policy-making board includes E. S. Macpherson, chief engineer, engineering staff, and four executive engineers.

THE BULL OF THE WOODS — By J. R. Williams

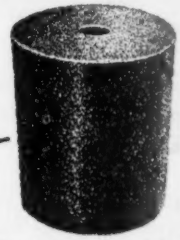
YOU! OLD TIMERS HAND ME A LAUGH! HOW HARD AN' WHAT LONG HOURS YOU HAD TO WORK--WHY, IF THEY LEFT THAT MUCH TO CUT OFF A SHAFT THESE DAYS THE TOWN LOAFERS WOULD ENVY US GETTIN' PAY FOR IT!
YEH, BUT YOU HAD TO BE A REAL MACHINIST TO GET A ROUND SHAFT OUT OF ONE OF THEM FORGIN'S! THAT GUY WOKE UP AN' FOUND HE WAS GOIN' TO HAVE TOO MANY FLAT PLACES!
12-14
J.R.WILLIAMS
THE GRAVEYARD
COPR. 1951 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.

WHEREVER THE HOT STUFF HITS

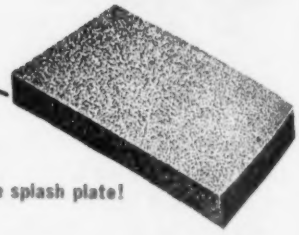
USE NATIONAL CARBON

TRADE-MARK

For the cinder notch liner!

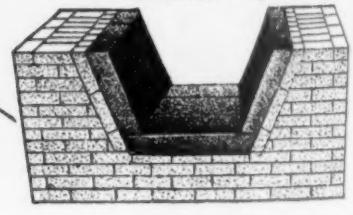


For the cinder notch plug!

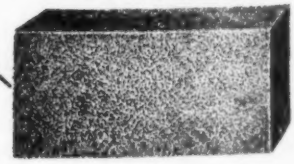


For the splash plate!

For the runout troughs!



For the skimmer plate!



● "National" carbon is now firmly established for blast furnace linings. It is being used outside the furnace as well—wherever there is contact with molten material—for the splash plate, runout troughs—clear down to the ladle—skimmer plate, cinder notch liner and cinder notch plug.

The reasons?

"National" carbon has no melting point. It is highly resistant to slag attack and thermal shock . . . not wet by molten metal . . . has a low thermal expansion . . . and maintains its mechanical strength at elevated temperatures.

Use "National" carbon inside and outside your blast furnaces and you cut down maintenance, speed up production and save money. For more information, write to National Carbon Company, Dept. I.

The term "National" is a registered trade-mark of Union Carbide and Carbon Corporation

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Coast Doubts CPR 98 Will Help

Western warehousemen see little relief from new pricing regulation . . . Hit area quota inequities . . . More buying of foreign steel noted . . . Scrap still a worry—*By R. T. Reinhardt.*

Western warehousemen are generally convinced that Ceiling Price Reg. 98 which goes into effect Dec. 16 won't result in any benefit for them and but little for their customers. Freight allowances can boost some prices of those whose traditional sources are far away and give a selling price advantage to warehouses which buy closer to home.

However, there is still competition, and after all the calculating machine tape is cleared away posted prices will be about the same for all warehouses. For a period of 2 weeks or so warehouse prices here will change from day to day until all are stabilized at, or as close as profitably possible to, those with the lowest freight charges.

Makes It Worse — Buyers from warehouses are still more concerned with availability than with price and have little hope of the new regulation being of any assistance to them—either in getting them more steel or in delivering it to them at lower prices.

Different Opinions — Warehousemen in the Pacific Northwest still contend they are taking a beating on allocations. One claims his inventory is down to 23 pct of what it was pre-Korea and that the base period chosen is to blame because of poor business at that time.

Such complaints aren't uncommon in the Seattle area, but Walter S. Doxsey, president of American Steel Warehouse Assn., last week didn't salve any wounds when he pointed out at a warehousemen's meeting there that there have been no changes in quotas to give relief to any section of the country.

Although warehousemen on other parts of the Coast aren't overly enthused with the supply situation, they generally feel that they are "doing as well as the average" and look forward to the second quarter of 1952 with much hope. In fact, several warehouses have expanded facilities in anticipation of improved supply and continuing high demand.

Steel is Steel—Foreign steel is better than no steel at all in the eyes of some manufacturers, while others are quite willing, as far as quality goes, to purchase steel made in Japan, Germany or France.

Holly Mfg. Co. of Pasadena, Calif., working on defense projects, recently told its employees through the company publication:

"In order to keep our level of activity we are making a concerted effort to procure foreign steel. Foreign steel, which is generally inferior in quality, can be used for items where surfacing, drawing qualities, etc., are not important, and where the operation or quality of the furnace will not be impaired . . . we feel justified in taking the calculated risk involved in buying foreign steel."

LAST LINK: Welders complete the 30-in. Gulf-to-Great Lakes natural gas pipeline where it crosses under a highway near Little Rock, Ark. Pipeline, owned by The Peoples Gas Light & Coke Co., Chicago, runs from Falfurrias, Tex., to Joliet, Ill.

Confused Market — In central California one mill continues to get $13.00 per ton over competition on merchant bars and structurals while in the southern part of the state the merchant bar market is soft and reinforcing steel is readily available.

In spite of all the confusion and inconsistencies of the market, many steel buyers are confident that by the second quarter of 1952 they will be well out of the woods barring a prolonged strike, or just as bad, a dry-up of scrap.

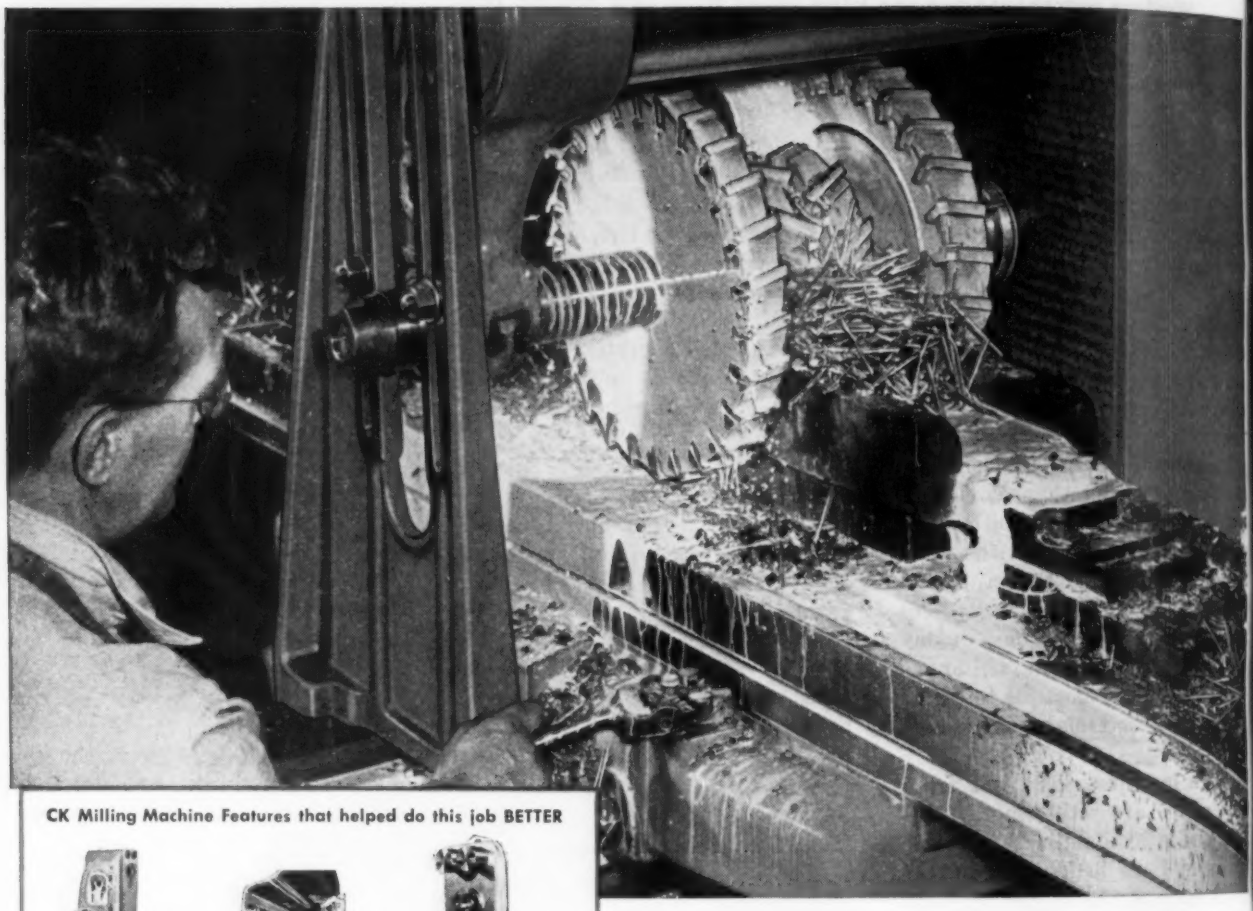
Repetitious But Serious—Scrap continues to be a high priority worry of steel producers in the West. With Seidelhuber Steel Rolling Mills getting into production this month with a 4500-ton-per-month electric furnace and Isaacson Iron Works committed to a British contract for about 8000 tons per month; a new electric furnace operation being discussed in Portland, and another large steel producing operation blue printed for Los Angeles, it looks as though it is going to take more than government directives to keep producers going.

More Metal—A recent shipment of 5000 tons of scrap from southern California to Isaacson on government allocation doesn't rest well with steel producers in the south who are already on a hand-to-mouth basis.

Farsighted observers believe that the ultimate solution to the western metallics shortage is more iron production which in turn means utilization of foreign ores.

FACTS TELL THE STORY...

NEW KEARNEY & TRECKER CK MILLING MACHINE PAYS USER BIG PRODUCTION DIVIDEND



CK Milling Machine Features that helped do this job BETTER

New CK column easily absorbed vibration from heavy cutting load.

CK's large (2" dia.) screw and extra-long table feed nut permitted heavy cut.

No. 60 heavy-duty drive flange on spindle drives heavy-duty arbor with multiple cutters.

CK's positive, metered, pressure and automatic lubrication assured wear-free operation.

Greater Horsepower of CK machine meant maximum results from modern cutting tools.

CK's 3-bearing spindle and flywheel assured fastest metal removal with desired finish.

24 different spindle speeds (13 to 1300 rpm) plus 32 different table feeds (3/5" to 90 ipm) meant operator selected exact combination to get fullest advantage from high horsepower and modern cutting tools.

The FACTS on this job are:

Machine: New 25hp No. 5, Model CK Plain.
Material: Cast Steel, 150 Brinell.
Feed: 4½ inches per minute.
Cutter Speed: 100 Surface feet per minute.
Rate of metal removal: 17.5 cu. in. per min.
Production rate: 4 parts per hour.
NOTE: Each part requires but a *single pass* of the cutter on the new Kearney & Trecker CK machine.

Old production rate 1½ parts per hour with two passes required per piece.

Investigate Kearney & Trecker's new CK line of milling machines. You'll find every feature is test and job-proven to give you cost-cutting results . . . greater machine capacity . . . greater productivity . . . better finished products. Contact your nearest Kearney & Trecker representative or write: Kearney & Trecker Corp., 6784 West National Avenue, Milwaukee 14, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

Make American Machines in Europe?

Midwestern industrialists reported negotiating to have U. S. tools made in Germany and France . . . May ask for American designs . . . Subcontracting chances are limited—*By G. Elwers.*

American machine tools, for the American market, may be made in Europe if negotiations now under way are completed. Reportedly, a group of Midwestern industrialists are negotiating with a view to having machines built for them in Germany and in France.

The group is not composed of machine tool builders. However it hopes to reach agreements with U. S. machine tool builders for use of American machine tool designs by European firms.

Shorter Delivery—The expectation is that these machines could be constructed and delivered here in a much shorter time than the same machines could if placed on order now with U. S. builders. Also, the group hopes that the cost would be lower than that of the same machines if built in the U. S.

Whether or not this idea will ever become a reality is still in doubt. It may be that no U. S. machine tool firm will want to cooperate. Although most machine tool builders here are not so worried about competition from foreign-built machine tools sold in the U. S. as they are about competition in overseas markets, they don't exactly welcome the competition here, either.

The plan to have tools built in Europe for sale here would create competition which might prove distressing when the present boom dies out.

Saving Erased?—There is also doubt about the feasibility of this plan from the quality and the cost standpoint. Tell Berna, general manager of the National Machine Tool Builders' Assn. recently told a world trade conference in Cleveland about the problems such a plan would face.

As far as cost goes, he said, there is a possibility that import duties and expenses plus the U. S. sales and service costs might erase the differential in original costs due to cheaper labor in Europe.

Distance—And there is doubt as to how closely even skilled European machine tool builders could follow designs originated an ocean away. Builders subcontracting machine tool work to firms here in the U. S. find that close cooperation with the subcontractor is essential if satisfactory work is to be done.

Constant supervision and consultation with the subcontractor is necessary. How well this necessary contact could be maintained when the tools are being built thousands of miles away, is problematical. Quality may be down.

"Who knows Swedish? Instructions for those imported tools just came in."

Not Over 35 pct—Subcontracting can't be a cure-all for the problems of expanding machine tool output. There is a limit as to how much of the work which goes into a machine tool can be subcontracted. According to a machine tool expert now with the NPA, the industry can't be expected to subcontract more than about 35 pct of its output.

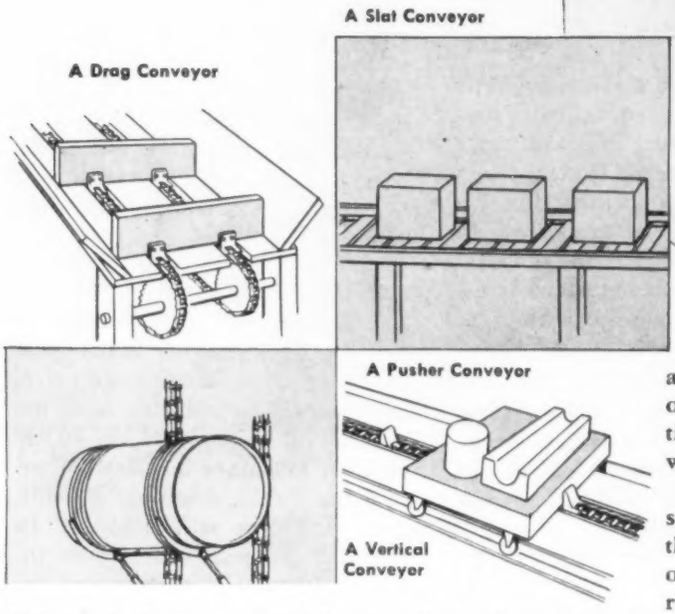
It is true that in some cases almost an entire machine tool is built by a subcontractor. But the number of shops which can take over to this extent and the capacity of these shops is limited. Most subcontracts for the construction of entire machine tools are only for an output of 5 or 10 machines a month.

Beating Deadline—Around Oct. 1, 1951, there were about 85,000 machine tools on order in the U. S., of which about 55,000 were priority orders. The industry is trying to work off as many of the 30,000 unrated machines as possible before the Feb. 1 deadline. In addition, priorities will probably be obtained for some orders now unrated, and some completion of unrated machines will be permitted after Feb. 1.

The fact that there are so many unrated machines on order does not mean that machine tool builders are not devoting most of their facilities to defense, however. Builders are not necessarily doing work on all these unrated machines. In many cases the orders are dormant, waiting for a time when materials and capacity are available to complete them.

Many machines for auto manufacturers are included in this category. But pressure from Detroit for their completion is strong, and the industry, which depends heavily on Detroit business in normal times, must listen.

it needs a "Handle"!



● Instead of costly, manual "push-pull-carry" methods, a modern materials handling system, such as an economical chain conveyor, is the answer to the problem of high non-productive costs. The complete Chain Belt Company line of conveyor chains and attachments can materially cut the non-productive costs incurred in transporting raw and finished materials to and from initial storage . . . through manufacturing and on to finished stores or shipping. They permit control of production and delivery schedules because they assure a regular flow of materials along assembly lines. They shorten production time per unit and eliminate the costly waiting time which usually results from irregular material flow.

Chain conveyors also assure most effective use of floor space. They usually eliminate the need for wide aisles and the necessity for extensive storage space around machines or processing stations. Chain conveyors increase safety by reducing congestion in aisles . . . by doing the heavy lifting and hauling mechanically. They are lower in maintenance costs as compared to other types of handling equipment . . . reduce cost of direct repairs and maintenance . . . eliminate need for storage quarters.

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The Iron Age

SALUTES

Alden G. Roach

Aggressiveness and a warm personality have won this man presidencies in three steel companies.

DAYS are too short and planes too slow to suit Alden G. Roach. This dynamic young steelman wrings from each hour every precious second.

Currently president of Consolidated Western Steel Corp. and Columbia Steel Co., Alden Roach will soon head the new Columbia-Geneva Div. of U. S. Steel Corp.

A unique ability to organize, an aggressiveness reflecting a pioneering spirit and a warm, friendly personality have made him a leader in the great industrial growth of the West.

Commuting the 400-mile round trip by plane between offices of Columbia in San Francisco and Consolidated in Los Angeles is a regular occurrence for the 50-year-old executive.

He's used to skintight schedules. When Consolidated was an independent fabricator of structurals, pipe and ships during World War II he hopped back and forth from plants and shipyards in California and Texas. Sleep was a stranger then. Today it's barely a nodding acquaintance.

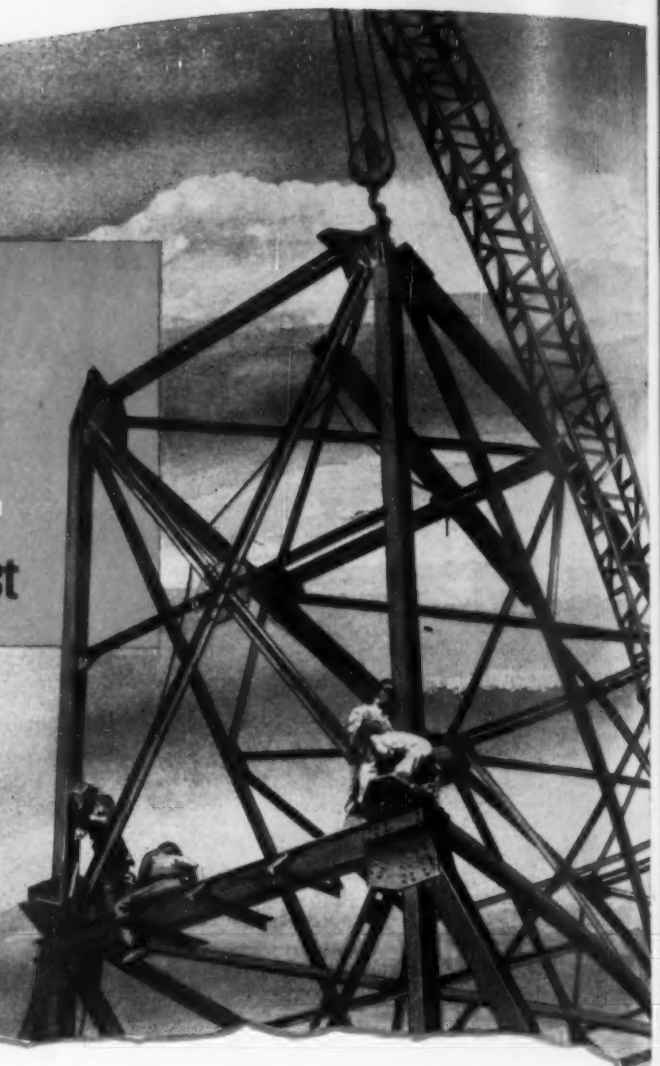
Alden Roach started with Laclede Steel Co., went to Union Iron Works at Los Angeles in 1927, and joined Consolidated Steel Corp., Ltd., in 1928. He became president of the company in 1941. After Consolidated was purchased by U. S. Steel in 1948 he was named president of Columbia Steel Co. as well.

In this busy schedule he finds time to join his wife, two daughters and son in his hobbies of raising orchids, playing tennis, swimming, sailing, and duck shooting.

accurate fabrication

saved erecting time and cost

In just a few words, the Jeffrey Manufacturing Co. expressed what so many Levinson customers have discovered . . . Levinson's accurate fabrication saves time on the job and cuts erecting costs to the minimum.



Thanks very much for your splendid work on this job. It helps considerably in making and retaining satisfied customers. The project engineer told us it was one of the easiest structural jobs ever erected in the field.

(Signed) L. E. Bixby, Mgr. Contract Dept.
The Jeffrey Mfg. Co., Columbus, O.

This Jeffrey belt conveyor stacker unit was installed at Brewster, Fla., plant of American Cyanamid Co., for handling phosphate rock. Capacity six to eight hundred tons per hour. Stacker is pivoted and travels in a 100-ft. radius for unloading and storage at any point. Another Jeffrey belt conveyor feeds material to stacker.

The **Levinson** STEEL COMPANY
20TH & WHARTON STS.,
PITTSBURGH 3, PA.

The Iron Age

INTRODUCES

F. J. MacDougall, named assistant to the director of purchases of ALLIS-CHALMERS MFG. CO., Milwaukee. **Ray E. Lewin,** replaces Mr. MacDougall as office supervisor. **Earl R. Narum** has been assigned to the Detroit district office of the general machinery division.

Thomas G. Lanphier, Jr., elected as vice-president of CONSOLIDATED VULTEE AIRCRAFT CORP., San Diego, Calif. **Routt A. Bryant, Jr.,** was appointed manager of plant engineering, guided missile division in Pomona.

Edward Crossley Lipman, named a director of CATERPILLAR TRACTOR CO., Peoria, Ill.

James H. W. Conklin, appointed general sales manager of the Philadelphia Div., YALE & TOWNE MFG. CO. **Richard L. Farr** has been appointed personnel administrator for the company.

E. J. Morgan, joined the industrial division of the Chicago office of J. A. ZURN MFG. CO.

A. K. Neff, appointed sales manager for STACKPOLE CARBON CO., St. Marys, Pa. **V. E. Gerber** was promoted to the position of assistant to the sales manager, and **Don L. Almquist** to assistant to the manager.

Harry H. Yeager, named general superintendent of plant operations by HARBISON-WALKER REFRACTORIES CO., Pittsburgh.

C. D. Hazen, appointed superintendent of engineering and maintenance, in charge of all such activities in every branch of its operations, for NEWPORT STEEL CORP., Newport, Ky. **H. W. Bradley** becomes general superintendent of the sheet mill section.

Percy L. Devoe, appointed vice-president and general sales manager of the newly formed Acme Steel Products Div. of ACME STEEL CO., Chicago.

D. E. Reichelderfer, elected comptroller of ARMCO STEEL CORP., Middletown, Ohio.

Warren G. Rosendahl, named assistant general manager of the new Hamilton, Ohio, division by the CLEARING MACHINE CORP.

C. Howard George, elected a director of the NEW JERSEY ZINC CO., succeeding **William Woodward** who has resigned. **Edward E. Schwegler** has been elected comptroller succeeding **Frederick H. Baxter,** who retains his title as vice-president of the company.

George H. Reiter, elected executive vice-president; **Fred T. Wiggins,** vice-president and general sales manager; **Charles B. Baker,** vice-president and general attorney; **Donald C. Leo,** secretary; and **Edward D. Depew,** assistant secretary of UNIVERSAL ATLAS CEMENT CO.

Julian Street, Jr., appointed a special assistant on the public relations staff of U. S. STEEL CORP., New York.

Michael A. Tubia, appointed general traffic manager of ST. JOSEPH LEAD CO., New York, succeeding **Walter G. Patton** who will retire Dec. 31, after 39 years of service with the company.

William A. Cannon, named general manager of the COLUMBIA MACHINE WORKS, Berkeley, Calif.

Turn Page

JOHN G. BUCUSS named president of the newly formed Acme Steel Products Div., of Acme Steel Co., Chicago.

W. W. WANAMAKER, Brigadier General, U. S. Army, retired, appointed chief engineer of the Orinoco Mining Co., Eastern Venezuela.

DON W. RYAN, recently elected assistant secretary and assistant treasurer of the American Steel & Wire Co., Cleveland.

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STEEL PLANT
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Curry!

Fast delivery of "hard to get" equipment . . . important cash savings . . . dependable installation and engineering of accessories—you gain all these when you buy surplus steel plant equipment from Curry. Perfectly serviceable and in good operating condition—we buy and sell complete rolling mills, roll grinders, shears, press brakes, cranes, ladles, motors, etc.

Before making any steel mill equipment purchase, you will profit by checking first with Curry.

Write for the "CURRY LIST"!

Lists all available surplus steel plant equipment. Get your copy NOW!

See our ad on page 208

ALBERT Curry & CO. INC.

STEEL PLANT EQUIPMENT

941 OLIVER BUILDING · PITTSBURGH 22, PENNA.
Phone ATlantic 1-1370

Personnel

Continued

G. P. Connell, joined the corrosion engineering staff of the HINCHMAN CORP., Detroit. Other engineers added to the staff are: **H. K. Lauer** and **Peter Nazero.**

John L. Fuller, promoted to the newly created post of manager of research and technical services, by the RELIANCE ELECTRIC & ENGINEERING CO., Cleveland.

Howard J. Stagg, appointed director of training for CRUCIBLE STEEL CO. OF AMERICA and will make his headquarters in Syracuse, N. Y.

Leroy A. Hughes, promoted to secretary-treasurer and general manager of the GLENVALE PRODUCTS CORP., Detroit, a subsidiary of Universal Die Casting & Mfg. Corp.

Robert O. Dunn, appointed field manager and **Mott B. Heath** has been promoted to manager of the community relations department of FORD MOTOR CO., Detroit.

R. F. Schultz, named assistant treasurer, Ingersoll Products Div. of BORG-WARNER CORP., Chicago.

L. J. Sorenson, elected to the board of directors of MOTOR PRODUCTS CORP., Detroit.

R. E. Belknap, Jr., appointed as manager of the New York district office of KAISER ALUMINUM & CHEMICAL SALES, INC.

Henry V. Ivory, appointed manager of the new Elizabeth, N. J., plant of NATIONAL ELECTRIC PRODUCTS CORP.

W. A. Tweedie, named factory manager of LUSCOMBE AIRPLANE CORP., Garland, Tex.

Daniel J. Duffin, appointed to the public relations department of AMERICAN LOCOMOTIVE CO., New York.

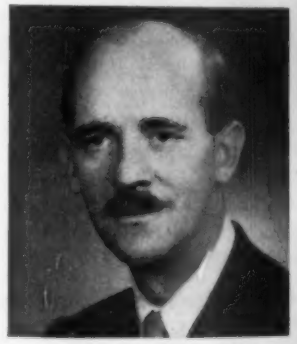
Donald R. McComb, named advertising manager of the WARNER ELECTRIC BRAKE & CLUTCH CO., Beloit, Wis.

Joseph C. Frantz, named sales promotion manager of the APEX ELECTRICAL MFG. CO., Cleveland.

Dr. J. B. Davidson, named consulting engineer to DEARBORN MOTORS CORP., Birmingham, Mich.

OSCAR E. MASON, recently elected vice-president and manager of Associated Engineers, Inc., Agawam, Mass.

JOHN L. HALLMAN, appointed as district sales manager at Philadelphia by the Alan Wood Co.



S. T. JAZWINSKI, recently appointed chief metallurgist for Central Iron & Steel Co., Harrisburg, Pa.

KENNETH W. DONLE, recently appointed chief metallurgist of Tube Reducing Corp., Wallington, N. J.

Giant
with
facile jaws
When the sturdy Brosius Auto Floor Forging Manipulator takes a billet or blank in its teeth, it improves upon every action possible with chain hoist and porter bar or cumbersome overhead equipment. More swiftly and easily it draws or charges . . . moves more quickly and independently across the forging floor . . . manipulates at hammer or press with more sensitive movements. Moreover, this remarkable modern mammoth brings to your forge shop added production, added safety, added economy — you should be using one. Write us.
It tilts up and down—
raises and lowers—
rotates—and moves
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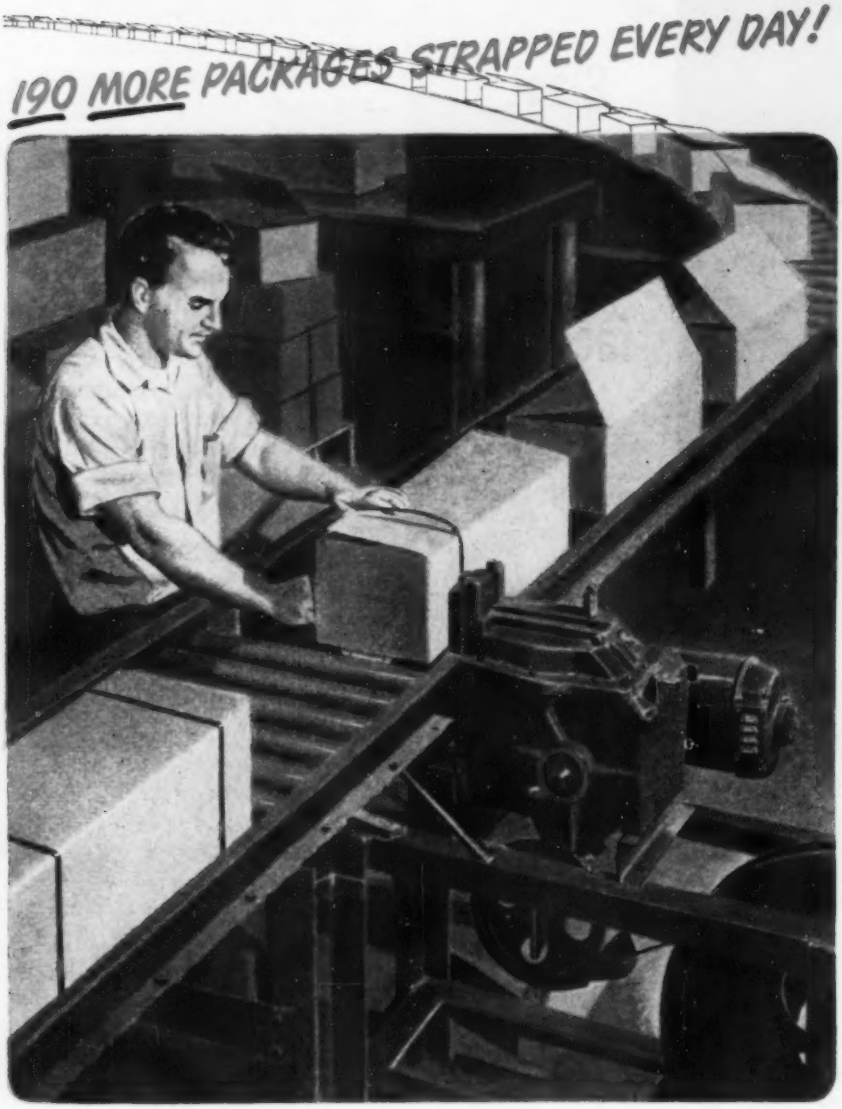
Affiliates: Salem Engineering Division,
Salem Engineering Co., Ltd., Milford nr. Derby, England; Salem Engineering (Canada) Ltd., Toronto, Canada



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—Personnel—

Continued

Warren I. Smith, heads the New York office of the ARTHUR COLTON CO., division Snyder Tool & Engineering Co. **Thomas Casey** and **Bruce Winner** joined the New York office sales staff as sales engineers. **William F. Schafer,** appointed sales representative, Philadelphia area. **Gordon W. Covey,** placed in charge of the Chicago office. **T. R. Cochran,** appointed sales representative for Northern California, Oregon and Washington territory.

William J. Brinkworth, appointed representative, distributor sales, Southwestern Div., for LINK-BELT CO., with headquarters in Houston.

Vernor L. Barbor, Jr., joined the staff of EXOTHERMIC ALLOYS SALES & SERVICE, INC. **Carl L. McVicker** will represent the company in the Chicago area.

LeRoy A. Ehmsen, appointed by HUBBARD & CO. to represent them as sales engineer, with headquarters in Des Moines.

Ralph W. Sponseller, appointed as sales representative in the Detroit branch of the Berger Mfg. Div. of REPUBLIC STEEL CORP.

Harry M. Hadley, appointed sales manager of the FAGEOL HEAT MACHINE CO., Detroit.

OBITUARIES

Charles Garland Thornburgh, 62, vice-president of the Rust Engineering Co., in Pittsburgh.

Charles N. Stevens, president of the Milwaukee Boiler Mfg. Co., Milwaukee.

John F. Segelcke, sales manager of the organic acids and plasticizers department of American Cyanamid Co.'s Industrial Chemicals Div., at his home in Teaneck, N. J.

Ernest E. Wemp, 70, inventor of clutches for automobiles and employed for over 25 years at Borg-Warner Corp. at Ann Arbor, Mich., recently.

Col. J. Theodore Whitney, 63, former president of the Whidden-Beekman Construction Co. of Boston.

Warren B. Hopkins, 65, former vice-president and general manager of Stone & Webster Engineering Corp., Inc., in Salem, Mass.

The Iron Age
FOUNDED 1855
Technical Articles

WHAT ARE PRESENT LIMITS TO ELECTRIC FURNACE SIZE?

By J. L. Bray
Professor of Metallurgical Engineering
Purdue University
Lafayette, Ind.

Barring unforeseen electrical developments, arc furnaces will probably be built in sizes smaller than 150-ton units. Furnaces will be better but physical and electrical factors will limit size. When current transmitted through transformer, busses, conductors, and electrodes is greatly increased, losses become disproportionately great. Power use is limited.

The electric arc melting furnace is the cheapest and quickest way to increase ingot capacity. It is more rapid and flexible—and thermally more efficient—than the openhearth. Greater demands for quality steel, new charging methods, better electrodes and more modern furnace equipment have boosted output. Production has grown steadily from 52,000 tons in 1910. Productive capacity in 1953 will be more than 9 million tons.

Electric furnaces of the future may be better than present equipment, but certain inherent limitations of arc furnaces may limit their size.

Laws which permit formulation and calculation of dc circuits do not hold where currents rapidly, and periodically, change direction. Energy is expanded not only in the conductor by ohmic resistance but also outside of it.

Energy is stored up and returned so that large currents may exist simultaneously with high voltages without representing any considerable amount of expended energy. Ohmic resistance becomes a relatively minor factor in current value.

In most dc circuits currents are of moderate value contrasted to the thousands of amperes when alternating currents are employed in arc furnaces.

Many furnaces installed before 1940 operated at voltages (E) of 100 to 250 v. Commonly, furnaces are now being operated at 300 v and the latest to be installed operated at 450 v. High voltages permit a long arc. With the proper current (I) this means high power input and high furnace temperatures. Low voltages produce short arcs with correspondingly reduced power input.

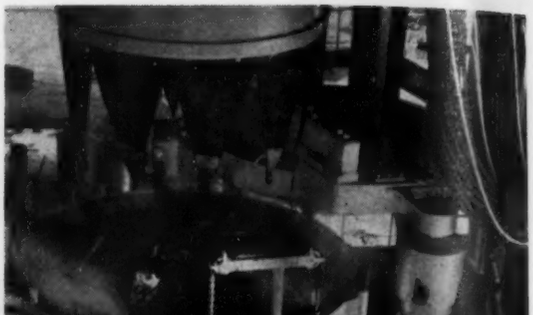
If the arc is too long, a large proportion of the energy does not enter the bath but is radiated to the walls and roof damaging these and lowering the life of the furnace lining. If the arc is too short, the production rate is lowered. A furnace charged with bulky, light scrap may, however, find a long arc advantageous.

In practice, there should be a definite relation between the voltage, currents used in the arc circuit, and the character of the charge. If secondary currents are too high a lower power factor (PF) and inefficient use of this power will result.

Resistance (R,r) is the property of the circuit opposing the flow of current and causing heat when current flows.

In ac circuits, the current and voltage are never in phase with one another. The power

TAPPING STEEL from electric arc furnace installed at Electric Steel Foundry Co., Portland, Ore.



TOP-CHARGED 60-ton furnace at Bethlehem Pacific Coast Steel Co. is readied for a new melt.

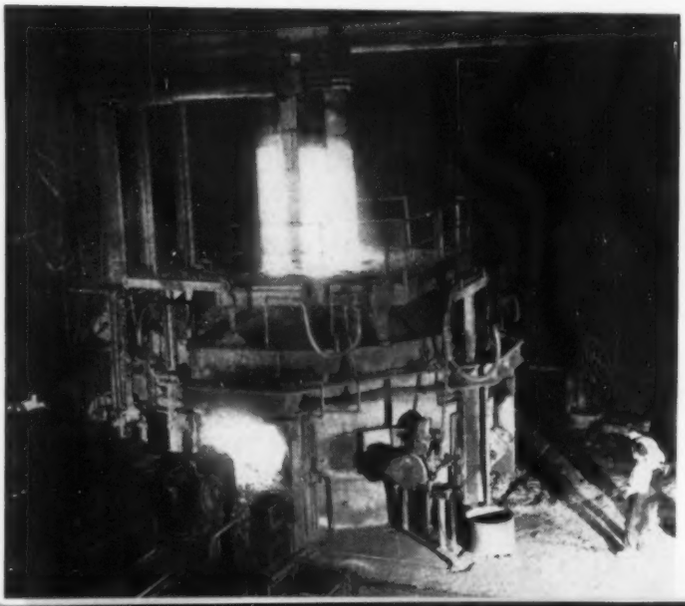
Electric furnaces (continued)

factor is defined as the ratio of actual power to apparent power. In any circuit in which the phase angle between the voltage and the current is 0 degrees, the power factor equals cos θ. It can never be greater than unity (in an arc furnace circuit, unless corrected, it is about 0.7).

"Skin effect" refers to the phenomenon, in a conductor carrying an alternating current, a tendency to crowd the current into the other layer or "skin" due to the self-inductance of the conductor. This increases effective resistance of the conductor and gives a lower current rating for a given temperature rise.

Skin effect is very important in heavy current busses, such as those used in arc furnaces, where a number of conductors are used in parallel. It affects each conductor and each group of conductors as a unit. Tubes have much less skin effect resistance than flat conductors of the same section. Tubes with thin walls are least affected by skin effect and may be water cooled.

ELECTRODES ARE lifted from side-charged furnace as loader moves forward, lower left, with new charge.



Proximity effect refers to distortion of current distribution in a bus caused by induction between currents in adjacent conductors. This causes a concentration of current in the parts of the busses nearest each other, increasing their effective resistance. In general, proximity effect is directly proportional to magnitude of the current and inversely proportional to the distance between conductors.

Inductance (L) expresses the ratio of flux linkages (total flux $\times$ number of turns) to the current producing the flux. The unit, the Henry, equals 108 flux linkages per ampere. Through induction, alternating currents in one conductor cause a voltage drop in the same or neighboring conductors. This inductive drop is not in phase with the current. It is permissible to assign to a group of such conductors an inductive resistance.

Inductive resistance causes power loss

This inductive resistance is a source of power loss with the very heavy currents encountered in electric arc furnace circuits. Inductance is proportional to frequency.

Capacitance (C) expresses the ability of the circuit to hold, or store, electric charges, the unit being the farad. Capacitance reactance is inversely proportional to frequency.

Reactance (X) is the property of alternating current circuits opposing the flow of current due to inductance, or capacitance, or both. The unit is the ohm and the resultant reactance is the difference between that due to induction and that due to capacity, i.e., inductive reactance = $2\pi fL$, capacitance reactance = $\frac{1}{2}\ \pi fC$.

Inductive reactance causes the current to "lag in phase," capacitance to "lead in phase" with the voltage. If these two balance the power factor becomes unity—the ideal condition. Impedance (Z) is the property of ac circuits opposing the flow of current, combining the effect of resis-

tance and reactance, the unit being the ohm, that is $Z = \sqrt{R^2+X^2}$.

Frequency (f) is the number of cycles per second. Arc furnaces usually use 60 cycle current (so that the power may be used for other purposes), but it may be as low as 25. The energy (W) is the capacity for doing work.

The buss bars for large electric arc furnaces must be very large. They are usually of hard drawn copper but may be made of aluminum. Current carrying capacity is limited by the heating effect produced by the current and and is usually based on a temperature rise of 30°C above a surrounding temperature of 40°C.

Busses 6x¼ in. in cross-section, depending upon the number of laminations (1 to 8) will carry from 1000 to 6000 amp. In busses carrying such high currents, stresses of considerable magnitude are involved during current surges. The busses must be firmly anchored and flexible cables intertwined, bound, and protected.

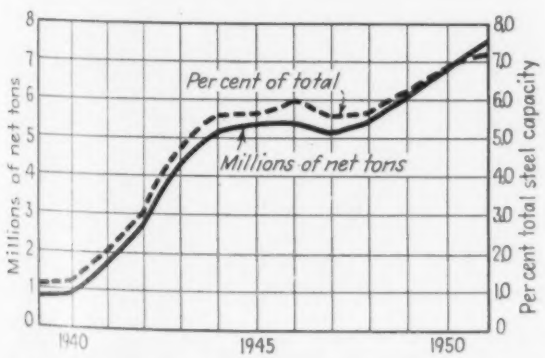
Stresses can be reduced

Stresses can be reduced by increasing the spacing between conductors, selecting a suitable buss arrangement, avoiding long spans, and by firm clamping.

By a combination of the above electrical effects, when the current flowing in the transformer, busses, conductors and electrodes is greatly increased losses become disproportionately great. For these reasons, the standard furnace now being built is about 70-ton capacity. One elliptical, 6-electrode furnace has a capacity of over 100 tons. It seems, however, that 150 tons is about the limit for a circular, 3-electrode arc furnace.

The average power factor of the furnace circuit depends on the size of the furnace, the amount of reactance in the circuit and the method of operation.

The reactance of the secondary leads is the principle limitation. Reactance varies considerably with design, installation and construction of the secondary current conductors (see characteristic curves) as well as the electrode supporting structure of the furnace.



PRODUCTION of electric furnace steel has jumped in the past 10 years. Capacity will be 9 million tons in 1953.

Large, or 60-cycle, furnaces with a transformer capacity of 10,000 to 15,000 kva seldom operate at much better than 80 to 85 pct power factor, even under most favorable conditions. Some power factor correction can be obtained by the use of synchronous condensers or by shunt-connected, static capacitors, the former for large installations and the latter for small units.

Power input will depend upon the lower factor and the reactance of the electrical system tends to lower this. As current is increased, the effect of the reactance is greater and the power factor falls off. This is shown in characteristic curves where H = the electrical efficiency, cos θ = power factor, W = total power, and W_u = useful power.

Current frequency a factor

Maximum power input occurs usually at a power factor of about 0.71. Any further increase in the current on the secondary lowers the power input. The resistance and reactance of the conductors further influences the power brought to the arc by reducing the current at which maximum heat is generated in the furnace. For any installation there is a maximum input to the arc.

Current frequency is another factor. With 25-cycle power, voltage drop is less than with 60-cycle because of the lowered effect of reactance.

In a furnace using 40,000 amp, the voltage drop, with 25-cycle current, was 21 v in the loop and 8 v in the conductors above the furnace. With 60-cycle current these two items were increased to 28 and 24 respectively. Again with 25-cycle current it was possible to achieve, in another arc furnace, a 15,000 kw maximum input at 92.5 pct power factor, but on changing to 60-cycle current, power factor was reduced to 13,000 kw.

Power use eliminated

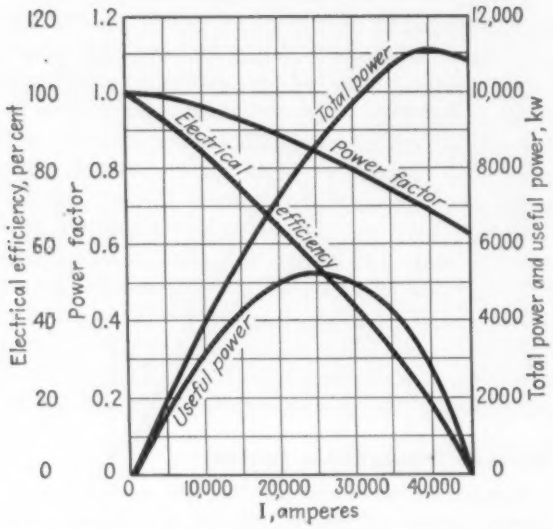
The amount of power that can be used in any furnace is distinctly limited. Beyond a certain limit, heat may be generated faster than it can be disseminated through the charge, superheating the metal, causing excessive agitation, damage to the refractories and slopping of the bath.

For theoretical reasons, the size of the arc furnace is definitely limited. An input of 4000 to 5500 kw appears to be the maximum for one arc and currents of 30,000 to 45,000 amp per phase seems to be the limit.

Barring new electrical developments, arc furnaces will probably be built in sizes smaller than 150-ton units. Another operating factor limiting the size of the furnace will be the demand for the type of steel. Ordinarily, electric furnace steels are quality steels, they have peculiar specifications and are limited usually to orders of less than 100 tons.

From the viewpoint of a power company, an arc furnace load is frequently undesirable, except

Electric furnaces (continued)



CHARACTERISTIC CURVES, based on 220-v, 60-cycle current, show relationship between electrical efficiency, power factor, total power and useful power.

as an off-peak load, because of voltage disturbances and the relatively low power factor when the furnaces are shorted. Small furnaces in outlying districts cause serious voltage fluctuations which impair the service to residential sections with lighting loads.

These effects can be minimized by use of reactances in the leads to limit the short circuit currents. This, however, reduces the power factor load which is objectionable since it loads up the generators to their current ratings with reactive power kva, whereas the power company is paid in terms of kilowatts.

This increased current increases conductor losses all along the line causing a still lower percentage of power to be expended usefully.

Voltage surges may be minimized by use of synchronous, or induction motors, of large capacity with heavy flywheels. When line voltage drops appreciably, these motors become generators to feed power back into the system. Voltage fluctuations may also be minimized by the use of special lines back to large sub stations.

In very large furnaces, the reactance of transformers and leads may eliminate the need for added reactance. If requirements are great enough, they may warrant construction of a high-power line back to a generating plant, or even an additional power plant. Again, the power factor of the load may be corrected by the use of over-excited synchronous motors running idle, or by a transformer to step the voltage up and apply it to a block of condensers.

Stainless steel licks corrosion, boosts synthetic rubber output

Corrosion-resistant stainless steel used to replace black iron in conveyer belts in the Government's Port Neches, Tex., synthetic rubber plant, has helped boost output and quality.

The black iron drier flights formerly used were short-lived and, because of rust and corrosion, contaminated the product.

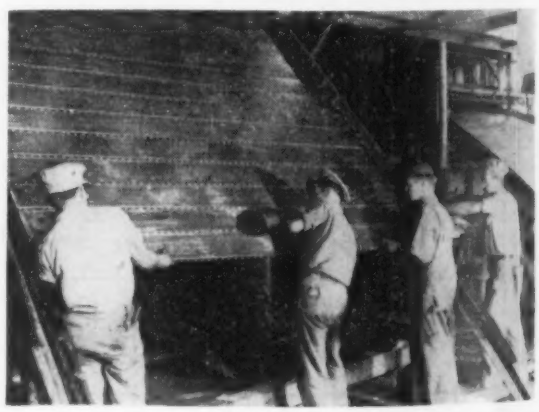
The plant, operated for the Office of Rubber Reserve by the United States Rubber Co., Naugatuck Chemical Div., was extensively modernized when it was reactivated last year.

The wet crude rubber, manufactured in a series of chemical reactions, is coagulated in an acid-brine bath. The latex is then washed and filtered. The crumb leaves the filter with about 30 pct water, and some sulfuric acid and salt not removed by washing.

Drier flights carry the wet crumb to ovens held at 175°F. The high humidity, salt and acid are ideal for corrosion.

When the plant was modernized, corrosion-resistant stainless steel was used to replace black iron in the conveyers. The eight conveyers each consist of 173 hinged sections of perforated 16-gage, Type 316 stainless steel.

Engineers report the problem of a rust-contaminated product has been overcome because there is no corrosive action on the stainless steel. Also, since the particles of crude rubber do not adhere to stainless steel as they did to black iron, the dried product is more easily removed from the conveyer.



STAINLESS STEEL drier flights have replaced the black iron type formerly used at the Government's Port Neches, Tex., synthetic rubber plant. A better product and more production have resulted. Plant is run by U. S. Rubber Co.

New aluminum alloy has improved 600°F properties

A new light metal casting material—"ML" aluminum alloy—has been developed by the Air Force for use in elevated temperatures. It has properties approximately one-third better than older alloys of this type. The need for such castings has been apparent with the design of new aircraft. Casings, supports, and other parts which operated at 200° to 300°F will now be designed for 500° to 600°F.

Development of the new alloy took place at the materials laboratory at the Wright Air Development center, Wright-Patterson Air Force Base. Additional information is available from the laboratory. The first step was to study all the alloys used by different nations for elevated temperature work.

From this group, four were chosen as being basic. There were "Y" alloy, "Hydronalium 511," "RAE 55," and "DCK," a theoretical laboratory alloy. Many melts based primarily on variations and combinations of elements of these four materials were made. Their physical and mechanical properties were evaluated.

Multiple failures often occur

It was observed that during elevated temperature tests, failure started in numerous places for some of the compositions. This phenomenon was arbitrarily called surface tear and was classified from none to extreme. Surface tear was considered to be undesirable, since alloys which exhibited this condition were found to be poor in creep. Manganese, in excess of 0.3 to 0.4 pct, and several other elements are undesirable, since they impart poor thermal conductivity to the castings.

A plan of microscopic study was carried out on each of the melt variations. The fractures of the room temperature and hot tensile test specimens were examined visually at low and high magnification to determine the manner in which the samples failed and the effect of the matrix and constituent material on the strength. As a result, a partially cellular constituent was sought which would act as a reinforcement, Minor or trace amounts of hard elements, which have partial solid solubility, were added to strengthen the matrix.

TABLE I

PROPERTIES OF ML ALUMINUM

	Temperature of test	
As-cast		
Yield strength	Room	31,000 psi
Elongation, pct in 2 in.	Room	1.2 pct
Minimum tensile strength	Room	30,900 psi
Maximum tensile strength	Room	36,400 psi
Tensile strength	400°F	29,300 psi
Yield strength	400	27,400 psi
Yield strength	600	14,500 psi
Elongation, pct in 2 in.	600	9.0 pct
Minimum tensile strength	600	16,150 psi
Maximum tensile strength	600	17,300 psi
Tensile strength after 1,200 hr stabilization	600	14,250 psi
Tensile strength after solution heat-treatment and age	Room	44,000 psi
Machined (skin removed)		
Minimum creep rate 0.002 pct/hr	600°F	4,100 psi
Stress rupture, 1,000 hr	600	6,600 psi

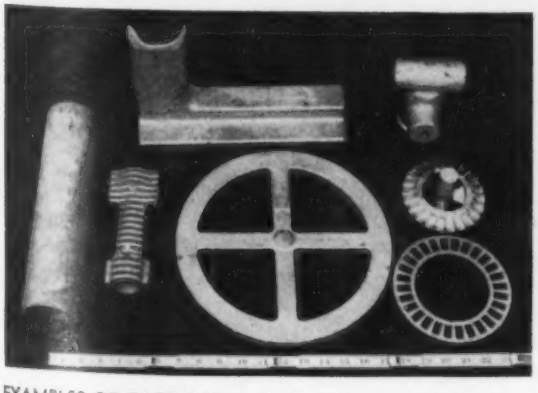
Nominal composition: 4 pct copper, 2 pct nickel, 2 pct magnesium, 0.3 pct manganese, 0.3 pct chromium, 0.05 pct vanadium, 0.1 pct titanium.

The alloy chosen from the experimental melts had considerably higher short-time 600°F tensile properties than any other aluminum alloy in general usage; see accompanying table. The manner of fracture at temperature was similar to a normal ductile material at room temperature without the notch effect of surface tear. The room temperature properties were good, and the toughness as indicated by impact tests was satisfactory. The room temperature properties were similar to Y alloy (142), and the casting properties did not differ too much.

Melting practice varies slightly

The melting practice varies slightly from the normal when making castings. In order to obtain desired microstructure and properties, it was found necessary to melt the metal and hold it at 1500°F for 30 min prior to chlorination or other degassing treatments.

The best pouring temperatures were found to be in the range of from 1325° to 1375°F. The highest tensile properties were obtained in this range. From the viewpoint of fluidity, castings could be poured satisfactorily as low as 1275°F. Sound castings were no more difficult to make in ML alloy than in Y alloy. Foundries pouring 142 aluminum alloy will find ML aluminum alloy handles similarly.



EXAMPLES OF CASTINGS made from the new ML aluminum.

PRODUCTION EXPERIENCE

by R. L. Redmond
Vice-President
Automotive Rubber Co., Inc.
Detroit

By directing plating solution flow from the cathode through a fabric diaphragm to the work being plated, surface pits, bumps and polarization are minimized. Also, experience shows that circulation of solution and filtration are improved. Higher current densities may be used and plating costs are lowered. Steel trough directs flow.

During a plating process, small particles (usually caused by polarization at the anode) are carried to and deposited upon the plated part. If these particles remain, they are bumps on the surface. If they are buffed out, they leave pits. Both ruin a plated finish. Years of trial and error have resulted in the diaphragming system. With adjustments for different types of plating, the development is more than paying its way.

Forty years ago platers were trying to filter plating solutions through fabrics to stop the insoluble particles before they got to the plated parts. There were always too many attendant problems to make their ideas feasible. Bags of a double thickness of muslin, separated by a layer of filter paper were tried. Such an anode bag—essentially the same in design and material—has been used in nickel plating solutions ever since. But the shortcomings of the bags were easily apparent, because of the time and labor necessary in the periodic replacement of the bags. Sludge often landed in the solutions as the anodes and their bags were removed from the tank.

As plating continues to be speeded-up, the bag will show further disadvantages. This speeding-up calls for higher current densities and rapid agitation is also necessary. Anode bags interfere with plating under conditions of rapid solution movement and high current density.

Anode bags were again brought into use in

LARGE PLATING TANK, in which diaphragm racks may be noted partitioning off cathode areas (at each side and down center of tank) from the two work lanes.

PROVES DIAPHRAGM PLATING

high-speed copper solutions, hoping to cut down the rough deposit resulting from the necessary operating temperatures and current densities. The cloth would not stand up in the hot cyanide solution and anolyte circulation was cut down around the copper anode, causing anode polarization and its attendant difficulties.

Logic dictated using the anode bag to enclose the entire anode compartment, separating the plating tank into anode and cathode compartments and leading to the diaphragm system. The necessity of rubber protection on plating equipment naturally drew Automotive Rubber Co.'s interest towards the diaphragming system.

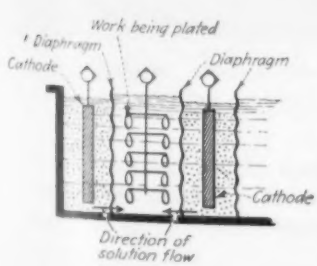
High-speed copper plating tanks are equipped by installing partitions of two layers of 11-oz fabric. These are suitably mounted on rubber-covered frames to separate the anode compartment from the cathode compartments, as shown in the accompanying line drawing. While plating, the solution is pumped continuously from the anode compartment through an efficient filter and back into the cathode or work area. This circulation method helps to prevent anode particles from reaching plating parts.

Polarization virtually eliminated

Pumping the solution from the cathode area through the fabric diaphragm into the anode area practically eliminates any polarization of the anodes. Thus, higher current densities may be used with diaphragming and bagging of anodes is unnecessary. Rubber lined tanks, rubber lined and covered pipe, fittings and contributing parts guarantee freedom from undissolved, microscopic particles which occur from exposed metal surfaces.

Another important advantage is a cleaner solution surface. The fabric diaphragm almost always extends below the solution surface, so that it must pass over the fabric, skimming the flow.

Well-accepted filtering systems in tanks without compartments still do not accomplish complete solution turnover in each cycle. With the diaphrgam compartments, solution turnover may be more exactly controlled, as the process dictates. Solution temperatures may be controlled with heat exchangers or coils installed beyond the pump and filter, much as in any conventional system.



CROSS - SECTIONAL DRAWING of a typical installation of diaphragms in a high-production plating tank.

Although the ideal diaphragm system is one installed in an entirely new plating setup, many excellent installations have been converted from existing equipment. Where there is sufficient tank space, specially-designed, rubber-covered frames may be installed, in which the diaphragms are placed. Where tank space is not adequate, anode baskets may be used. These rubber-covered steel baskets are fitted with large fabric bags which take the place of the tank diaphragm. In this type of installation, several baskets may be connected together in a long tank.

Steel trough used to direct flow

This method may present a problem. The solution may show a tendency to withdraw from the tank outlet nearest the pump. This can be easily corrected to produce uniform flow by using an inverted steel trough, perforated and completely insulated with rubber. These are laid on the bottom of each anode basket. The bottom edges of the trough are irregular so that the solution may flow freely. Holes may be drilled in the rubber wherever necessary. This method equalizes the solution intake in all sections of the tank.

Diaphragming is not only for the 50,000-gal tank operator. Definite advantages are just as apparent in 500-gal, 50, and even 5-gal tanks. The small operator cannot perhaps employ the solution control enjoyed by larger shops, but he is assured of improving the quality of his deposit without adding to his payroll.

More than one fabric has been used in diaphragming. Canvas duck, 11-oz in weight, has been used almost entirely until very recently. However, longer life may be obtained from spun nylon cloth in alkaline solutions, although it is difficult to obtain at the moment. Spun "Dynel" has been tested and found suitable for both alkaline and acid solutions, both from the standpoint of length of service and chemical resistance. "Chemstrand," another synthetic fabric, is being currently tested for diaphragm use. All of these synthetic fabrics have mesh openings comparable to the 11-oz canvas.

The hundreds of plating shops using diaphragming arrangements are plating faster and getting more production per unit time. They are realizing improved solution turnover with greater efficiency of filtration. All are able to take advantage of higher current densities. A smoother, more uniform grade of plating has resulted, with less buffing, less rejections and lower costs.

MACHINE seamwelds front fenders FASTER

By W. G. Patton
Detroit Editor

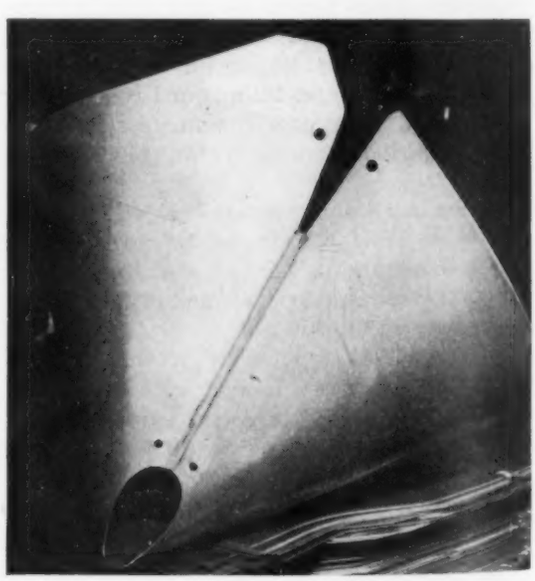
Buick front fenders are being seam welded on an ingenious new machine which combines the advantages of a fender bender and seam welder. Production rate is 180 fenders per hr. Heating operation for forming around headlight area has been eliminated. Savings in press time, handling and finishing have been effected.

Front fenders are being made at Buick in a new machine which ingeniously combines a fender bender and a seam welder. The machine welds on the inside surface of the folded fender. The mash welder applies enough pressure to reduce the thickness of the metal in the welded area to approximately the same thickness as a single sheet. In addition to high production, metal finishing time is substantially reduced. The new method offers a reduction in press time as well as greatly reduced materials handling.

Formation of the front fender of a modern car with inserted headlights has always been a time-consuming, troublesome operation. Until recently, Buick front fenders were made in the conventional manner in presses from flat steel blanks. Because of the design, the metal in the headlight area had to be reheated prior to final forming and trim operations.

The new welder, designed and built by Resistance Welder Corp., Bay City, Mich., eliminates the "hot fender." Production rate is in excess of 180 fenders per hr. The same machine handles both right-hand and left-hand front fenders.

The forming unit consists of hinged, folding members equipped with hardened and ground pins and anti-friction bearing mountings. The main hinge on the back of the fixture is so constructed that the breaking point of the blank is always in proper relative position to the upper part of the fixture.



FOLDED FENDER has weld on inside. Welding eliminates need for heating before final form and trim.

Four locating holes are provided to position the blank for forming and welding. The four locating pins have adjustable mountings to provide necessary line-up for weld lap.

Each of the three folding members of the fixture is individually actuated by direct-connected, double-acting cylinders. The cylinders are cushioned at both ends. Each has a hydraulic flow control valve so that correct synchronization of the folding sequence is assured.

The welding head unit is mounted on a vertical slide which is hydraulically operated. Designed to weld on the inside surface of the folded fender, the machine has the welding spline mount on the outer folding arm.

The outer welding die consists of a water-cooled holder with a renewable spline-type copper alloy insert. Welding speed is 25 to 30 ft per min.

A hydraulically-operated, current-carrying, wedge type member moves down from the upper support and contacts the welding spline backup. This closes the secondary circuit for direct welding. It also acts as a backup clamp for the outer die and, thereby, enables it to withstand the internal weld pressure.

Transformer water cooled

The transformer has internal water-cooling. A copper secondary is provided. Heat is controlled with an 8-point heat regulator which is completely enclosed. Clamps hold the work during the welding operation, insuring proper location and an $\frac{1}{8}$-in. overlap for the mash seam weld.

The machine has hydraulic equipment throughout, including hydraulic sump, combination pump and all necessary valving and accessories. Control circuit is 110 v, 60 cycles.

After the sheet metal blank has been loaded into the machine, dual palm buttons are pressed to start an automatic sequence of operations:

(1) Hinged unit rises to clamp work against upper backup.

(2) First bend is made to wipe the front end of the fender up into position.

(3) Second bend is made to wipe the side portions of the fender up.

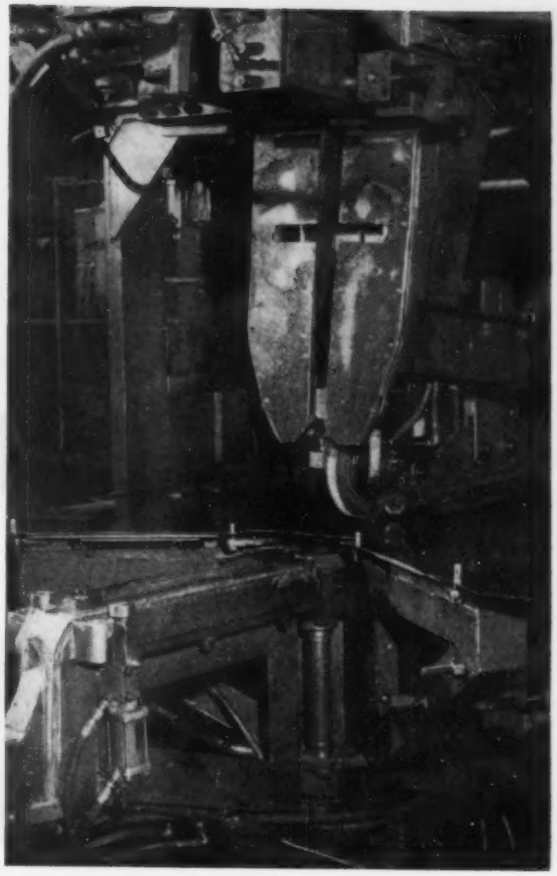
(4) With clamps and spline in place, the upper current-carrying clamp and contact move down into position.

(5) Inner welding roll hinges in and starts the welding operation—traveling the full length of the seam.

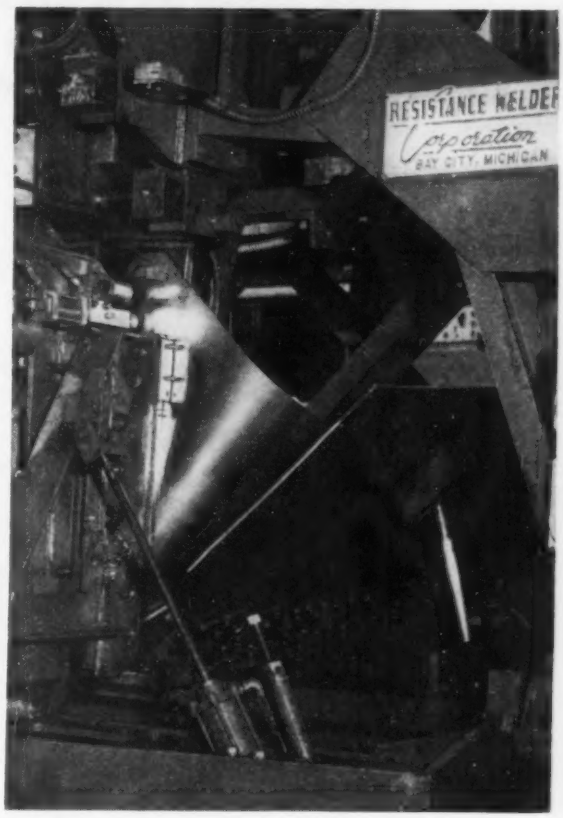
(6) Welding completed, the hydraulic locating pins retract, upper contact clamp retracts, all gates return to normal and hinged unit lowers, leaving work free.

Work is manually unloaded from the machine.

Since welding is on the inside surface, a smooth joint appears on the outside of the fender. The joint below the front headlamp cannot be detached after painting. No leading is necessary.



WELDING HEAD is mounted on hydraulically operated vertical slide. Welding spline is on outer folding arm.



MAIN HINGE of folding unit aligns breaking point of blank properly with upper part of fixture.

Fatigue Strength of NODULAR IRON Tested

by T. E. Eagan
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Tests were carried out on specimens cut from both standard cylinders and actual castings. Endurance ratio for the material is approximately 0.34. An 0.050-in. notch reduces fatigue strength by a factor of 1.3 for heat-treated material, 1.45 for as-cast. Elongation is usually lower in castings than in keel blocks.

The endurance limit in dynamically stressed parts of nodular iron is very important. This is true of both the notched and unnotched conditions. Some data have been obtained on various melts, both in the as-cast and heat-treated (ferritized) condition.

Interest is centered in rather large castings with heavy sections. Therefore, test figures

TABLE I — ENDURANCE LIMIT

Test No.	Diam. of Fatigue Specimen, in.	Heat No.	Chemical Analysis, Percent							Physical Condition	Specimens Taken From
			Total Carbon	Si	Mn	P	S	Ni	Mg		
1	0.350	50	3.43	2.19	0.47	0.13	0.009	1.95	0.077	Heat treated	Compressor head
2	0.350	75	3.62	2.66	0.36	0.08	0.006	1.94	0.081	As cast	Extension shaft
3	0.350	75	3.62	2.66	0.36	0.08	0.006	1.94	0.081	Heat treated	Extension shaft
4	0.350	92	3.38	2.33	0.32	0.03	0.008	1.75	0.083	Heat treated	Unloader body
5	0.750	1	3.20	2.33	0.68	0.15	0.008	1.87	0.085	Heat treated	8 in. OD x 4 in. ID x 12 in. cylinder
6	0.750	11	3.44	2.17	0.44	0.07	0.007	1.68	0.082	Heat treated	Pressure vessel
7	0.750	126	3.43	2.40	0.45	0.05	0.004	1.72	0.081	As cast	Pressure vessel
8	1.000	6	3.48	2.15	0.51	0.12	0.008	1.78	0.081	Heat treated	8 in. OD x 4 in. ID x 12 in. cylinder
9	1.000	79	3.41	2.48	0.44	0.06	0.007	1.98	0.083	As cast	8 in. OD x 4 in. ID x 12 in. cylinder
10	1.000	125	3.47	2.55	0.62	0.05	0.018	1.91	0.096	As cast	8 in. OD x 4 in. ID x 12 in. cylinder
11	1.000	125	3.47	2.55	0.62	0.05	0.018	1.91	0.096	Heat treated	8 in. OD x 4 in. ID x 12 in. cylinder

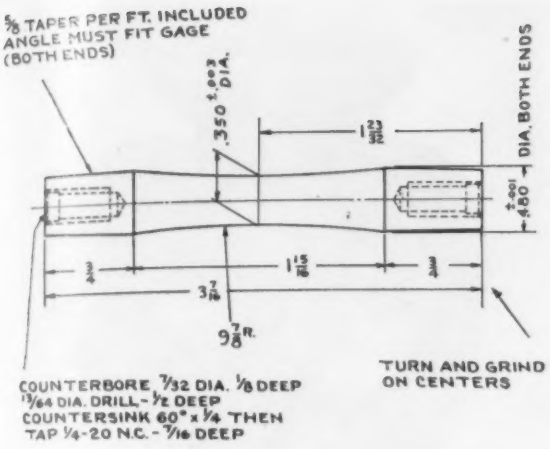
5/8 TAPER PER FT. INCLUDED ANGLE MUST FIT GAGE (BOTH ENDS)
.350 +.002 -.000 DIA.
DIA. BOTH ENDS
.480 +.001 -.002
TURN AND GRIND ON CENTERS
COUNTERBORE 7/32 DIA. 1/8 DEEP
13/64 DIA. DRILL - 1/2 DEEP
COUNTERSINK 60° x 1/4 THEN
TAP 1/4-20 N.C. - 7/16 DEEP

FIG. 1—Size and shape of 0.350-in. fatigue specimen.

based on specimens cut from a test cylinder 8-in. OD x 4-in. ID x 12-in. long are included. These results (on various metals) have been previously reported.[1]

However, information on the endurance limit of material cut from actual castings was also needed. Test results on both the standard cylinders and the actual castings are summarized in Table I.

Test specimens 0.350-in. diam were tested in a R. R. Moore-type rotating bending machine. Specimens of 0.750-in. and 1-in. diam were tested at 3750 rpm in similar (although larger) equipment. Both machines were built by Baldwin Southwark Co.

The 0.350-in. diam specimens were machined to the dimensions shown in Fig. 1. The 0.750 and 1 in. were machined according to Fig. 2. The notched specimens were machined according to Fig. 3. All of the specimens were polished according to the American Society for Testing Materials' manual on fatigue testing.[2]

The section thickness of the metal in the castings from which the specimens were taken required that the smaller 0.350-in. and 0.750 in. diam be used. Wherever possible, the 1-in. diam specimen was used. In the case of the notched specimens, the 1-in. diam specimens were used.

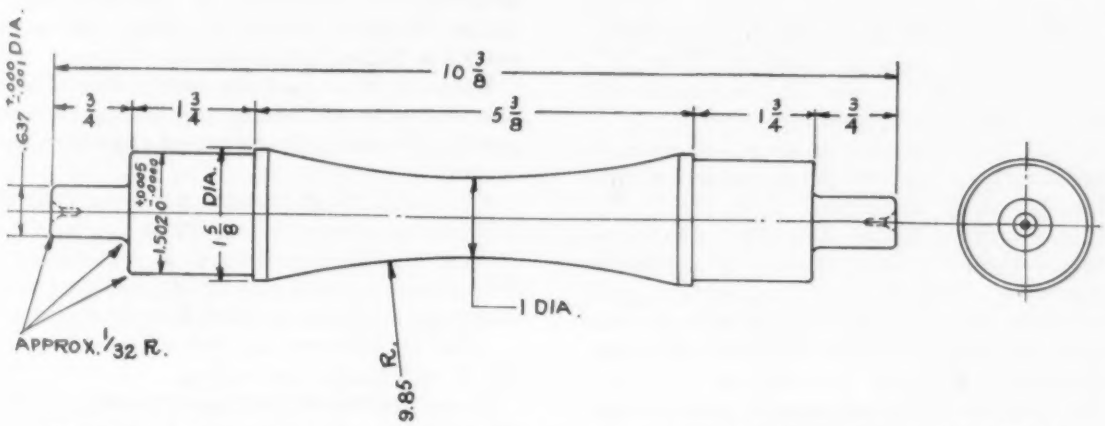

FIG. 2—Size and shape of 1-in. fatigue test specimen. In some cases, 1-in. diam was reduced to 0.750 in.

OF NODULAR IRON

Section Thickness	Tensile Strength, psi	Yield Strength, psi	Elongation, pct	Endurance Limit, psi	Endurance Limit, (Corrected for specimen size), psi	Endurance Ratio, (E.L./T.S.)	Endurance Limit, Notched (0.050 in. radius notch), psi	Endurance Strength, Reduction Factor K_f	Test No.
1 7/8 in.	78,200	58,300	5.0	34,000	25,200	0.446			1
5 1/2 in.	71,500		0.0	33,500	24,800	0.469			2
5 1/2 in.	64,300	57,600	3.5	32,500	24,000	0.505			3
1 3/4 in.	66,000	51,100	10.0	28,000	20,700	0.425			4
2 in.	80,000	60,000	7.5	27,500		0.344			5
1 5/8 in.	67,400	52,500	6.0	21,500		0.319			6
1 5/8 in.	68,700		0.0	24,000		0.349			7
2 in.	71,500	57,200	8.0	24,000		0.336	18,500	1.3	8
2 in.	86,200	.....	8.0	31,000		0.360	20,500	1.5	9
2 in.	86,000	.....	1.5	29,000		0.337	21,000	1.4	10
2 in.	78,600	.....	7.5	26,500		0.337	20,000	1.3	11

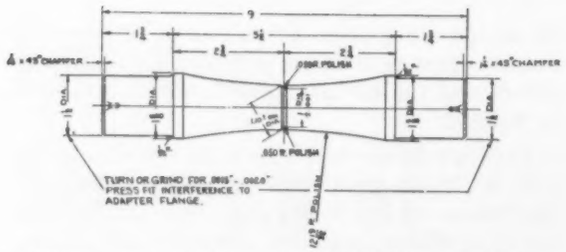

FIG. 3—Size and shape of notched fatigue specimen.

Nodular iron fatigue strength (continued)

Moore and Morkovin[3] have shown that the endurance limit tends to become a constant for notched specimens 1-in. diam or larger.

The endurance limit obtained with the 0.350-in. specimens was higher than that of the two larger diameters. This is best reflected in the endurance ratio. The 0.350-in. specimens gave a ratio of between 0.425 and 0.505, while the larger specimens were between 0.319 and 0.360.

The accuracy of the loading of the two machines was checked with SR4 strain gages. They were found to be exactly the same. As a further check, a fatigue test was made using a standard 8 in. OD x 4 in. ID cylinder on cast steel. In this case, 0.350-in. specimens were cut from the unstressed ends of the 1 in. specimens. The results are given in Table II. There is a decided difference in the fatigue test results obtained due solely to specimen size.

In this case, the larger specimen gave an endurance limit 91.5 pct of the value obtained using the smaller specimen.

This confirms Moore and Morkovin,[4] who obtained higher fatigue strength in specimens under 0.5-in. diam than from specimens up to 2 in. They show a distinct tendency for the fatigue strength to be the same for any diameter over 0.5 in.

The average of the endurance ratio for the 0.350 in. nodular iron specimens is 0.341. Thus, the ratio for the larger specimens is 74 pct of that for the smaller diameters. Therefore, if the endurance limit obtained with the smaller specimens is corrected for specimen size by taking 74 pct of the actual values, the results shown in Table I are obtained.

TABLE II

CHEMISTRY, PROPERTIES OF CAST STEEL*

Chemical Analysis, pct:	
Carbon	0.30
Manganese	0.75
Phosphorus	0.032
Sulphur	0.040
Silicon	0.25
Nickel	0.16
Chromium	0.21
Molybdenum	0.07
Tensile Properties:	
Tensile strength	73,400 psi
Yield point	47,900 psi
Elongation in 2 in.	15.0 pct
Reduction of area	18.0 pct
Bhn	141

Endurance Limits:	Endurance limit	Endurance ratio
0.350 in. specimen	29,500 psi	0.402
1.000 in. specimen	27,000 psi	0.368

* Material, electric furnace cast steel; section thickness, 2 in.

FIG. 4—A large compressor head that was tested to destruction. Specimens were taken from flange section.

These results are quite comparable to those obtained with the larger specimens. For comparison purposes, the corrected endurance limit is used.

Both as-cast and heat-treated metal from the same material was tested. These are tests 2, 3, 10 and 11. The heat treatment was chosen to give a matrix which was almost 100 pct ferrite. It consisted of 2 hr at 1700°F and furnace cool to 1250°F, followed by 10-hr furnace cool to 900°F and, finally, air cooling.

These tests show that heat treating does not change the endurance ratio. However, it does change the endurance limit, according to the tensile strength obtained.

Tests 6 and 7 also show comparative results of the as-cast and heat-treated material. In this case, however, two different heats are represented. The as-cast shows a somewhat higher endurance limit than the heat-treated material. This may be attributed to the higher silicon in the analysis.

The compressor head shown in Fig. 4 had test specimens taken from a critically stressed section. The extension shaft, Fig. 5, is normally used in the as-cast condition. A 6-in. long test extension is provided on each shaft, the diameter of which is 5½ in. This is normally used for determination of tensile strength. The fatigue specimens were cut from this extension of one shaft. One-half was given the normal heat treatment, the other was used in the as-cast condition.

An unloader body for a compressor had test

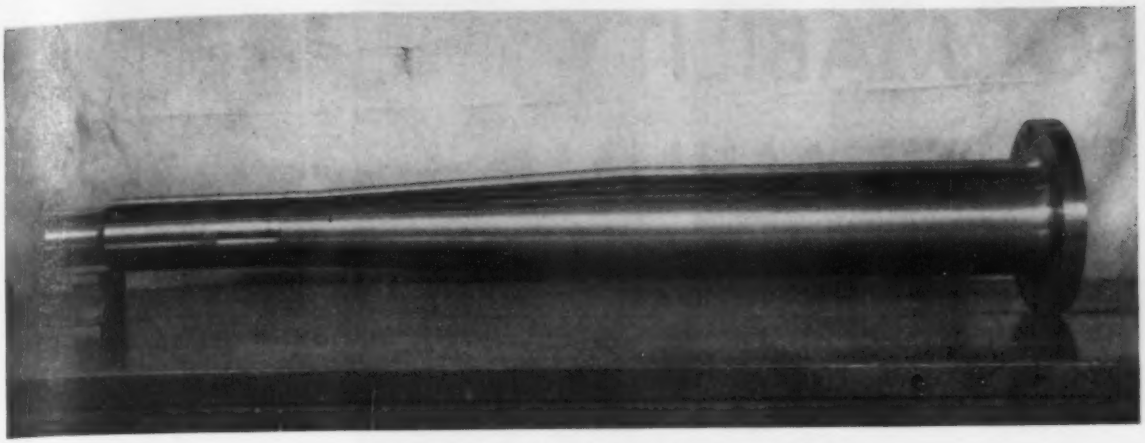

FIG. 5—Extension shaft from which specimens were taken.

specimens cut from dome section. The pressure vessel, Fig. 7, was a special one, used for some special testing. The specimens were taken from the barrel of the vessel.

The endurance limit of the specimens from the castings shows the same endurance ratio as those obtained with the test cylinders.

There has been little work done on the effect of notches on the endurance limit of nodular iron. Grant[5] has reported one test taken on nodular iron, containing cerium. He used 0.301-in. diam specimens with a 40° notch and a root radius of 0.25 mm and another set of specimens with a 0.050-in. radius. A fatigue strength reduction factor for the 45° notch of 2.22 and 1.48 for the 0.050-in. radius groove was obtained. Tensile strength was 91,500 psi and the endurance ratio 0.49. Judging from the microstructures, the material was apparently in the as-cast condition.

Magnesium-bearing castings tested

One test of notch effect of heat-treated nodular iron containing magnesium has been reported by the author,[1] shown in Table I as test 8. Three other tests have subsequently been run. These are included in the table as tests 9, 10, and 11.

The fatigue strength reduction factor for the as-cast tests was 1.5 and 1.4 respectively, giving an average of 1.45. The heat treated material had a factor of 1.3 in both tests. Although the as-cast nodular iron is slightly more notch sensitive than the heat-treated, one or two tests is certainly subject to correction as more data is accumulated. The results are somewhat comparable to Grant's figure of 1.48 for the 0.050-in. notch, if allowance is made for size of specimen.

Some question may be raised about the ductility of the material tested. The elongation of the heat-treated material varies from 3.5 to 10 pct. No elongation for the as-cast state is shown. The high elongation figures in published literature for both heat-treated and as-cast nodular iron were obtained from well fed keel blocks.

As a general rule, tensile strength and yield point of specimens taken from castings agree quite well with those obtained from keel blocks. The elongation, however, is usually much lower in the castings than in the keel blocks.

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[2] "Special Technical Publication No. 92," American Society for Testing Materials, 1949.

[3] Moore, H. F., and Morkovin, D., "Second Progress Report on the Size of Specimens in Fatigue Strength of Three Types of Steel," ASTM Proceedings, p. 109, Vol. 43, 1943.

[4] Moore, H. F., and Morkovin, D., "Progress Report on the Effect of Size of Specimen on the Fatigue Strength of Three Types of Steel," ASTM Proceedings, p. 45, Vol. 42, 1942.

[5] Grant, J. W., "Notched and Unnotched Fatigue Tests on Flake and Nodular Cast Iron," Research Report No. 251, British Cast Iron Research Assn.

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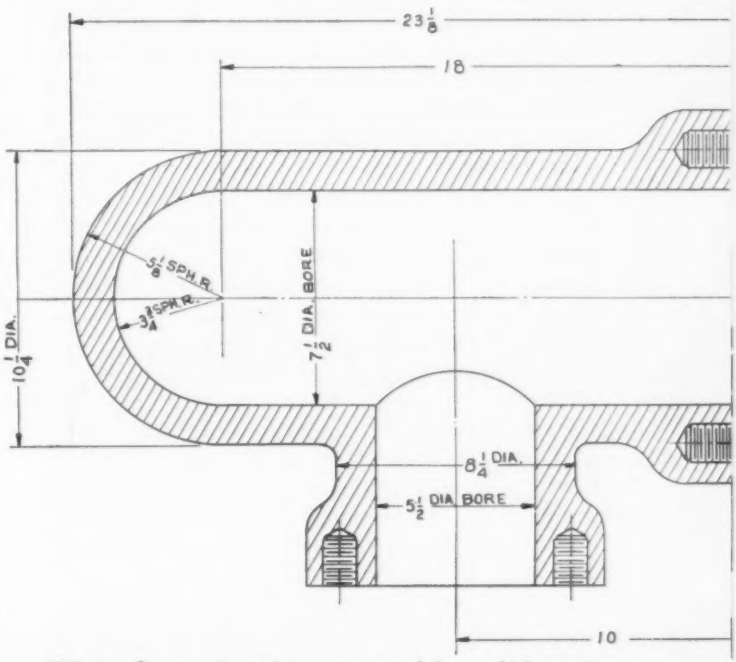

FIG. 7—Cross-section of pressure vessel from which specimens for fatigue tests were taken.

FORMABILITY OF TITANIUM INVESTIGATED

By O. A. Wheelon
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Studies of the formability and machinability of commercially pure titanium show that in general it forms like magnesium, machines like stainless steel. Most forming must be done hot. Studies included use of stretch forming, the Hydropress, power brakes, rolls and planishing hammers.

ome people today anticipate replacing high strength aluminum alloys, even at normal temperatures, by titanium when suitable alloys are developed. While such applications may be practical eventually, the present interest centers largely around its moderate high temperature uses.

Conventional aircraft have for the last 15 to 20 years used aluminum alloys in structural applications. While these materials lose some of their properties as the temperature is raised, they retain many advantages up to approximately 300°F.

In the 300° to 700°F range, titanium and its alloys have considerable strength-weight advantages over the stainless steels which are being used in this temperature range. Because of its high melting point, titanium also makes a suitable fire shield up to 2000°F. It will not burn through even though it may have to be ultimately replaced.

Douglas recently undertook a project in which weight was an extremely critical factor. A preliminary analysis showed that a limited application of commercially pure titanium would make possible a saving of approximately 5 pct of the structural weight. Despite high cost, titanium represented the most economical method for saving this critical weight, provided parts could be fabricated with reasonable means.

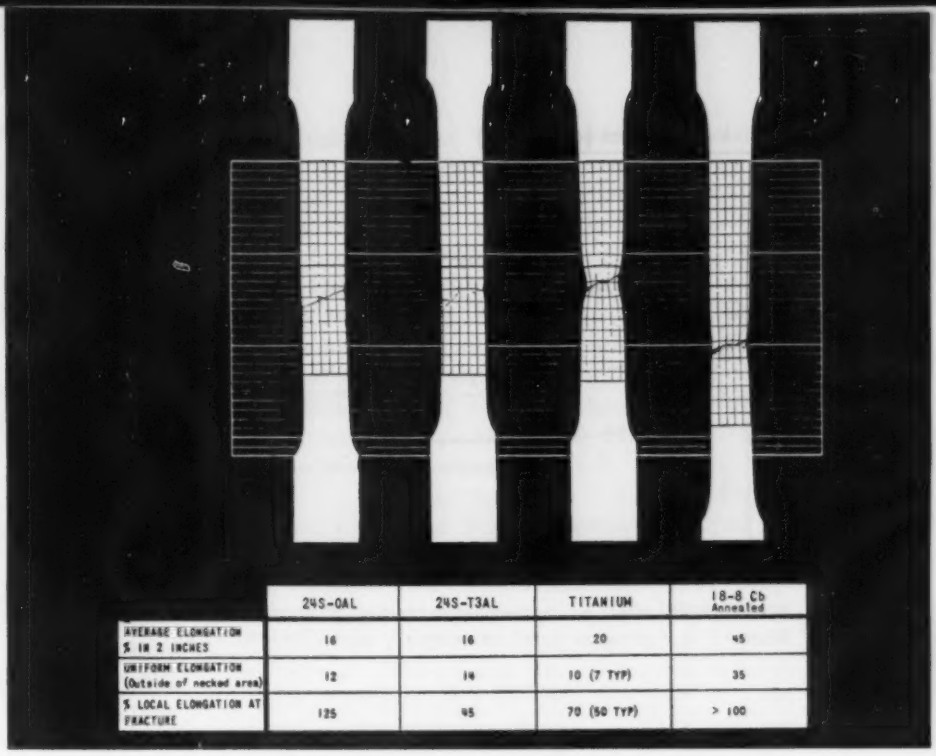
A screening program was initiated to determine the fabrication characteristics with the limited amount of material which was then available. The commercially pure titanium produced by Remington Arms was used. Work was carried far enough to insure the producibility of titanium structures.

The following tools were made for the fabrication of parts: 83 Hydropress form blocks, 41 stretch form dies, 415 layout templates, 4 mill fixtures and 4 production contour check tools.

Failures in power brake operation were traceable to two causes: Material defects, and the tendency of light gage sheet to leave the punch and seek its own radius.

The latter difficulty was resolved by forming into a rubber pad which held the material against the punch. The presence of defects, however, was a much more serious problem. It was decided to utilize hot forming, since the material showed good response to heat in preliminary tests.

A portable oven capable of maintaining a temperature of 875° was built, and an electrically heated brake die holder previously built for use with magnesium was reworked to maintain a punch and die temperature of 500° to 520°F. Parts were preheated in the oven before each bend and were at a temperature of 600°F after completion of the bend. The use



	24S-0AL	24S-T3AL	TITANIUM	18-8 Cb Annealed
AVERAGE ELONGATION % IN 2 INCHES	16	16	20	45
UNIFORM ELONGATION (Outside of necked area)	12	14	10 (7 TYP)	35
% LOCAL ELONGATION AT FRACTURE	125	95	70 (50 TYP)	> 100

STRAIN distribution in tensile specimens of aluminum, commercially pure titanium, and stainless steel.

of heat virtually eliminated breakage in bending operation.

Power brake tests showed that a bend radius of 3½ may be used for annealed sheet if hot forming is employed.

In the Hydropress, all parts were formed on steel dies with a steel pressure plate. Steel dies were used because it was assumed that extensive post-forming by hand would be necessary, and that much of it would be done hot. It was therefore decided to utilize hot forming.

Since the quantity of parts was small and expense of making heated dies was prohibitive, the following procedure was used in hot Hydropress forming: Form blocks were preheated to a temperature of approximately 200°F. The part was then placed on the form block and heated with a hydrogen-oxygen torch until the material turned to a golden color, or even blue. The temperature was approximately 800°F. The part and form block were then covered with an asbestos sheet to protect the rubber pad on the Hydropress, and forming completed. Temperature of parts after forming was approximately 400°F. Any hand forming required was done hot by heating with a hydrogen-oxygen torch.

Bend cracking eliminated

This particular part was a Z section, 2 in. deep and 3 in. long, in 0.064-in. material. It had a straight flange and a slightly contoured shrink flange. By using the above method, practically all cracking in bend radii was eliminated. With the use of heat, form blocks made to quarter hard stainless steel springback proved to be generally acceptable for forming titanium.

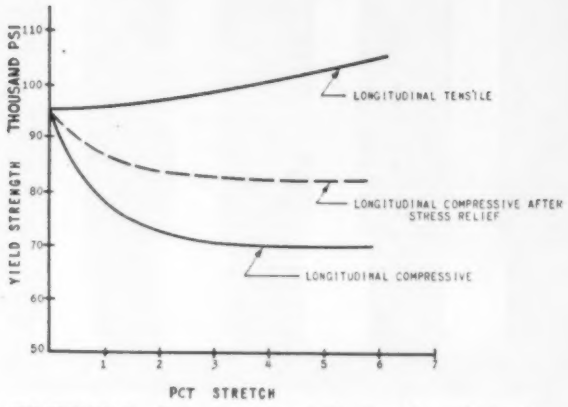
A beaded panel was formed in 0.016-in. annealed material. Beads did not form to full depth because 1100 psi was insufficient pressure. Warpage was similar to that encountered in 24S-T beaded parts. The part was usable when the edges were tied into the structure.

Electrically heated platens for the dies and portable ovens for heating the parts would facilitate production, the tests indicated. Higher Hydropress pressures, on the order of 3000 to 5000 psi, will be required for the heavier gages. The use of 24S-T strain limits with appropriate pressure cutoffs is an approximate guide which should suffice until more complete data are available for titanium.

In tooling for stretch shapes, stretch blocks were made net with no springback allowance. Kirksite was used for the form block material.

About 100 Z-section frames of two types were made on a Hufford stretch press. One type was of 0.081-in. material with considerable variation in contour, and no return flanges. The second type was of 0.040-in. material with

NECKING failure, typical of those of stretched parts.



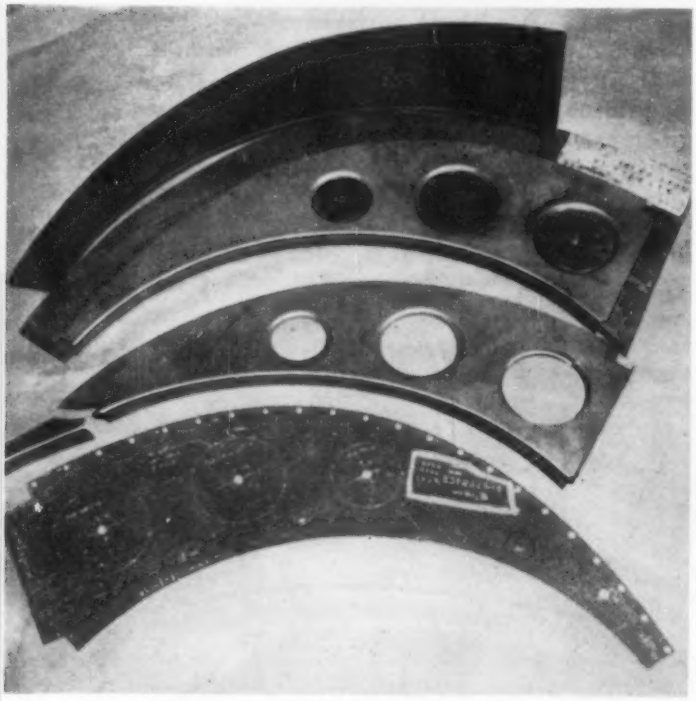
STRETCHING effect on mechanical properties of titanium. Material is Remington Arms' commercially pure titanium.

fairly constant contour, and a return flange on the compression side.

Dimensional variations in the brake-formed sections caused bevel angle, web depth and contour discrepancies. Small longitudinal cracks in the bend radii were successfully stretched and subsequently salvaged by welding.

Defects, large cracks from brake operations, and grip jaw indentations caused breakage in the stretching operation. Parts which failed away from the block were generally salvageable.

Parts failed in the stretching operation by necking at areas of high strain. Severe local necking without failure caused loss of flange height. This was avoided by allowing excess material to compensate the loss, and a trim operation was added after forming.



AIRCRAFT frame fabricated from titanium on Hydropress.

Frames with high webs twisted badly in the first stage because sufficient pre-stretch could not be employed to offset the tendency to buckle on the inner flange in wrapping, without fracturing the outer flange. However, interstage anneal, second stretch and subsequent handwork produced satisfactory parts.

The frames with severe changes in contour generally over-formed. Since mold line contour tolerances of ± 0.010 were maintained, all frames were hand worked to contour afterwards. In order to set the varying bevel, the outer flange was vibrated while under load. This operation also assisted forming by reducing block friction and by permitting the creep characteristics of the material to work to advantage.

Cold handwork caused breakage, and heat could not be employed with the Kirksite blocks. Thus parts had to be hot-formed without the assistance of blocks, except for checking.

These tests showed that accurate sections prior to stretching should be employed. These could be fabricated by rolling, or power brake and drawbench sizing. Sections should be used with a return flange on the tension side to prevent flange height loss and inhibit necking tendency. Parts should be split so that regions of high strain with straight or gradual intermediate contour are avoided. The use of high webs should be avoided on severe contours. A maximum of 10 pct stretch should be used, assuming neutral axis at the inner flange. Stretch blocks should be made of steel to permit the use of heat in handwork.

Tests were made forming stretched and crowned sheet skin parts. They showed that for parts in limited quantities, roll forming and planishing hammer will produce accurate and satisfactory parts. Normal stretch press practice may be employed provided good quality material is used.

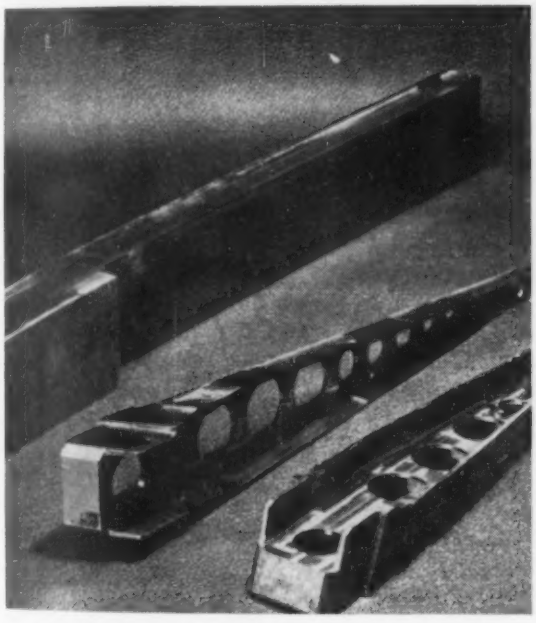
Hand work needs heat

Practically all formed parts required subsequent check and straighten work by hand, which could not be performed at room temperature without breakage. Torch heating was employed, and parts were heated to approximately 750°F. The temperature was controlled by color indications since the material is golden at 600° to 650°F and blue at 750°F.

Lightening holes blanked and formed on the punch press required torch heating to avoid breakage. Indications were that drawn parts would require heated dies of the type employed for magnesium.

Machining tests showed that in general, titanium is comparable in machinability to stainless steel. The chief source of trouble was caused by work hardening that occurred under

CONSTANT contour Z frame fabricated from titanium. At top are tools used. Center shows part that failed due to a defect in the material, a frequent problem.



AIRCRAFT fitting machined from titanium forging.

the cutting tool when making light cuts. Deep cuts minimized this problem.

Milling was accomplished with standard 1⅜-in. diam, 2 and 4 fluted high-speed end mills at 250 rpm with feeds of 0.008 ipr. The lubricants and coolants used were the same as those used for stainless steel.

Drilled annealed titanium was accomplished with hand feeds using standard high-speed drills running at 675 rpm. Penetrating oil was used as the lubricant. Tapping was done with high-speed taps, with the same lubricant.

The major difficulty encountered in machining, drilling spot facing, counterboring and tapping titanium was the tendency for the cutters, drills and taps to quickly lose their cutting edges. Some drills required resharpening after each hole was drilled.

The tendency toward warpage, as a result of machining, was greater than with cold-rolled or stainless steel, and almost all parts required straightening after machining.

Several fittings were machined in the shape of a tapered channel about 2x3x20 in. from annealed hand-forged bar stock.

It was planned to rough out the parts by bandsaw in order to obtain some scrap bar for other tests. This required a bandsaw pass 3½ in. deep and 12 in. long. Every attempt to make this cut by sawing, from heavy feed-slow speed cutting, to friction sawing, was unsuccessful. A special attempt was made to make the cut on a power-feed-table saw without success. These parts were eventually split milled and then cut through ⅛ in. by a pass of a bandsaw. After roughing, the parts were machined without difficulty in the usual way. The resulting finish was better than 100 RMS microinches. Several small pieces of scrap bar were smoothed on a bench grinder. No particular fouling of the wheel was noticed.

Sharp tools, heavy feeds needed

Drilling, countersinking, filing and deburring operations required sharp tools and heavy feeds to offset work hardening. Trimming through 0.040-in. gage was accomplished with sheet metal snips, and heavier gages were cut on high-speed power saws ordinarily employed for quarter hard stainless steel.

Heat was employed for all reforming operations and resulted in a reduction in time normally expended. Monel rivets, flush and shaved on external surfaces, were employed for all titanium structure. Marking from the riveting operation was eliminated due to the hardness of the material. Excellent contour and surface appearance was achieved.

As a result of this program, it was possible to design and manufacture a large number of titanium parts with a minimum of expense and lost time. An actual weight saving of approximately 395 lb on a project whose weight was critical was accomplished. Titanium parts represented approximately 5½ pct of the structural weight. By careful control, scrapped parts were held to approximately 5 pct. Unusable scrap was held to a low value, and the finished sheet metal parts accounted for 61 pct of the weight of the purchased sheet less remaining usable sheet and culls.

Based on a paper delivered at the SAE National Aeronautic Meeting, Los Angeles, October 3, 1951

Nickel saved by substituting 430 for 18-8

As defense needs absorb steel production, more steel users are seeking substitutes for chromium-nickel steels. Steelmakers can now add nickel only to stainless destined for high-priority use.

Users of the 302 stainless grades have been forced to consider type 430 chromium stainless, and the titanium modified 430T, as alternates for 302. Corrosion resistance of 430 is exceptionally good.

Results of Republic Steel Corp.'s findings were recently published in *A Guide to Type 430 Stainless Steels as Alternates of the 18-8 Series.*

The 430 group is resistant to weak organic acids (such as nitric acid). It lacks the resistance to pitting by dilute reducing acids shown by the chromium-nickel series.

High resistance to scaling and oxidation at high temperatures are shown by type 430. Its low coefficient of expansion permits easier design of heating and high temperature equipment.

Higher yield points

Type 430 and its modifications lack the high strength at elevated temperatures characteristic of chromium-nickel stainless steels. They tend to become brittle at room temperature after prolonged operation at 88° to 1000°F. Ductility is regained if the metal is reheated to 1400° to 1500°F and cooled. (See Table I).

Ductility is about 50 pct that of chromium-nickel steels. The 430 grades have higher yield points. The 430 steels do not stretch form as readily as type 302. (See Table II).

The chromium steels have a tendency to directional properties, and are more sensitive to breaking in the course of longitudinal lock seaming and bending. They may also exhibit stretcher strains when dead soft, annealed stock is drawn. This can be controlled by light temper rolling. These steels do not age-harden.

Annealing can be accomplished at 1400° to 1500°F. With controlled atmospheres, pickling may not be necessary between draws. The light scale may be removed in later pickling operations.

TABLE I

HIGH TEMPERATURE PROPERTIES

	430 and 430T	302
RECOMMENDED MAX. TEMPS.		
Continuous	1500°F	1600°F
Intermittent	1600°F	1450°F
CREEP VALUES, psi		
1 pct elongation in 10,000 hr		
1000°F	8500	17,000
1100°F	5000	12,000
1200°F	2000	7000
1300°F	1300	4000
MEAN COEFFICIENT OF THERMAL EXPANSION		
Per °F x 10^{-6}		
32-212	5.8	9.6
32-600	6.1	9.9
32-1000	6.3	10.2
32-1200	6.6	10.4
THERMAL CONDUCTIVITY		
btu/sq ft/hr/°F/ft		
212	15.1	9.4
932	15.2	12.4

TABLE II

MECHANICAL PROPERTIES

	1020	302	430	430T
Ultimate tensile strength, psi	55,000	85,000	70,000	65,000
Yield point, psi	40,000	40,000	50,000	45,000
Ductility, pct elongation in 2 in.	30	55	25	30
Hardness Rb	70	85	85	78

TABLE III

CHEMISTRY OF STAINLESS 430 AND 430T

	430	430T
Carbon, pct	0.12 max	0.10 max
Manganese, pct	1.00 max	1.00 max
Silicon, pct	1.00 max	1.00 max
Chromium, pct	14.0 to 18.0	16.0 to 18.0
Titanium, pct		0.30 to 0.70

May require anneal

The 430 steels do not work-harden as severely as 302. For this reason the chromium grades are not subject to stress cracking after drawing. On deeper draws it may be necessary to anneal before beading.

In tank construction it may be desirable to equalize sectional strength by making flanged and dished heads from a heavier gage of type 430, than would be used with type 302. Type 430 work-hardens less. Where heads of both types are annealed before assembly this would not be a factor.

Type 430T (See Table III) is a modified form of 430 designed for better welding characteristics. The alloying conditions and balanced chemistry control grain growth and structural deformation at the time of welding.

All welding methods except forge welding can be used. Fusion welding with an inert gas shield has produced best results. Filler rod should be either 304 or 310 for better ductility.

The 430 stainless steels compare favorably with type 302 in buffing and polishing operations. Their lower thermal expansion helps retain flatness where heat develops in polishing operations. The surface of the 430 group develops a higher color with the same amount of work than can be produced on type 302. When polished, the surface resembles chromium plate.

Contact KAYDON of Muskegon

FOR ALL TYPES OF BALL AND ROLLER BEARINGS: 4" BORE TO 120" OUTSIDE DIAMETER

another "JOINT SUCCESS" story:

KAYDON and Spicer Needle-Bearing P.T.O. JOINTS power take-off joints*

KAYDON standard size precision needle rollers available in 1/16" to 5/16" diameters, flat or rounded ends. Tolerance: .0002" on diameter

*Product of Spicer Mfg. Division of Dana Corp., Toledo, Ohio

precision needle rollers by KAYDON

most compact, high-capacity anti-friction bearing possible

Small, compact, ruggedly built, with high capacity for both continuous and intermittent service, Spicer Needle Bearing Power Take-off Joints meet all power-take-off needs dependably and economically.

As in many other applications, KAYDON precision needle rollers prove they provide the most compact, high-capacity anti-friction bearing possible . . . at low cost. You get the benefit of economy in addition to highest performance-proved quality, in small or large quantities.

Billions of these needle rollers, in standard 1/16" to 5/16" diameters, are in use in automatic and conventional automotive transmissions, universal joints, clutches, steering gears and precision assemblies in many types of machinery. Used between hardened shafts and hardened bores of housings or gears, they eliminate need for bearing races . . . and therefore require no more space than so-called plain or "solid bearings."

When you design for needle roller use, contact KAYDON of Muskegon.

KAYDON Types of Standard and Special Bearings:
Spherical Roller • Taper Roller • Ball Radial • Ball Thrust • Roller Radial • Roller Thrust • Bi-Angular Bearings

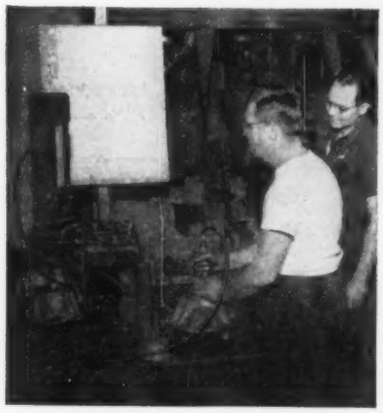
THE KAYDON ENGINEERING CORP.

MUSKEGON • MICHIGAN

PRECISION BALL AND ROLLER BEARINGS

PRODUCTION IMPROVED at International Harvester with Sheffield Precisionaires

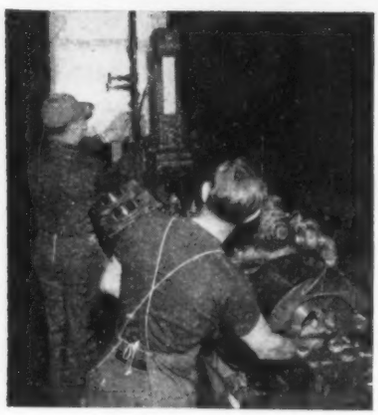
The following are actual on-the-job comments from the Fort Wayne Plant, Motor Truck Division of International Harvester where Sheffield Precisionaire gages are on the job.



SUBJECT: Differential carrier reaming operation.
Does air gage and quality control chart help?

FOREMAN: "They enable us to know where we are. Quality is improved, resulting in better pinion cage assembly fit."

OPERATOR: "It's the best thing we ever had. We can see gradual size change and be on guard to know when to change reamers. I have no worry about scrap or rework."



SUBJECT: Ring gear boring operation.
Has air gage and quality control chart been helpful?

FOREMAN: "Scrap was reduced from 3% to practically nothing. Improved method of setting boring tool and redesigned facing tool were developed. Air gage check is much faster than old method."

OPERATOR: "We know where we are all the time."

For more information about Precisionaires, other Sheffield products and services write to "Customer Consultation."

5834

the *Sheffield* corporation
Dayton 1, Ohio, U. S. A.

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CONTRACT SERVICES • THREADING TOOLS

—Free Literature—

Continued

Metal hose

A 16-p. product-design catalog has been prepared for users of metal hose. Information on metallic bellows of stainless steel, brass, bronze and other alloys is included. These bellows find wide use in control devices. *Chicago Metal Hose Corp.*

For free copy insert No. 14 on postcard, p. 151.

Air compressors

Complete engineering data covering Cooper-Bessemer's Type-M motor-driven compressors are described in a new bulletin. They range from 250 to 1000 hp with standard two-stage units and 300 to 1000 hp with standard single-stage units. *Cooper-Bessemer Corp.*

For free copy insert No. 15 on postcard, p. 151.

Gas atmospheres

A new bulletin on industrial applications of gas chemistry for heat treating describes atmosphere generators. Gas generation processes are schematically diagrammed. Compositions of each gas atmosphere and the respective heat treat process applications are described. *Surface Combustion Corp.*

For free copy insert No. 16 on postcard, p. 151.

Industrial trucks

A cross-section of Easton experience and facilities in the production of industrial trucking equipment is presented in a new bulletin. Many standard and special types of transportation equipment are pictured. *Easton Car & Construction Co.*

For free copy insert No. 17 on postcard, p. 151.

Dust analysis

A new bulletin describes the equipment, operations and application data of the new General Power Plant Corp.'s gas dust analyzer with Brown ElectroniK potentiometer. The recorder checks the operation of precipitators. *Minneapolis-Honeywell Regulator Co.*

For free copy insert No. 18 on postcard, p. 151.

Turn Page

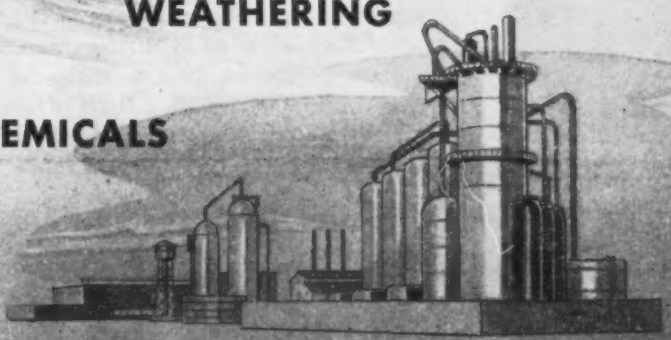
Rubber Parts to Resist . . .

TEMPERATURE

OILS and GAS

WEATHERING

CHEMICALS



ABRASION

STALWART-developed rubber compounds are available in mass produced parts to meet your applicational requirements. These parts retain their physical, chemical and dielectric properties regardless of the effects of extreme temperatures, oil and gasoline, chemical action, abrasion and weather.

STALWART rubber compounds are supplied in precision molded, extruded, die-cut and lathe-cut shapes for application in aircraft, automobiles, trucks, marine equipment, railroad rolling stock, processing equipment, electrical assemblies, and other equipment. In addition, these parts can have varying degrees of hardness, tensile strength, and elongation to meet individual, S.A.E. or A.S.T.M. specifications.

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192-SR

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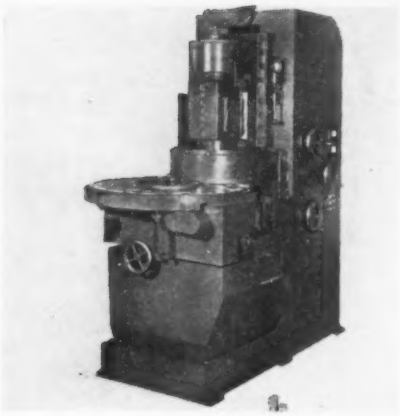
NEW equipment

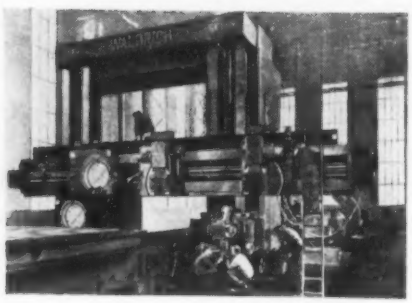
New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 151 or 152.



Grinder finishes both sides of thin flat parts

Equipment for precision grinding both sides of thin flat parts in one operation consists of a double vertical surface grinder. Its vertical column mounted on a sub base is provided with ball bearing ways on which the two grinding heads and head slides move with ease.. Tilting heads allow 23-in. diam abrasive disks to be set to the angle for best grinding results. Head movement is controlled by hand wheels located on the side of the column. A similar hand wheel actuates the dresser. Guides properly locate workpieces while entering between the abrasives and when leaving. Parts are hand loaded into the rotating carrier, and unloaded automatically by gravity. When polishing ceramic parts, 2 in. square, production averages 30 to 40 parts per min. *Gardner Machine Co.*

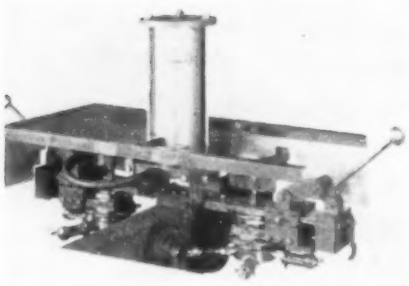
For more data insert No. 19 on postcard, p. 151



Planer features special method of clamping tool

The tool holder on the Waldrich-Siegen heavy duty planer does not drop into working position by gravity after table return, but is mechanically raised for reverse and pressed into position for the working stroke. This cuts down on lateral yielding and vibration chatter. Head of the machine is clamped automatically to the guides during cutting time. Special rigid construction is used for the cross rail. The machine is designed and powered for the use of carbide tools. *Kearny Mfg. Co.*

For more data insert No. 20 on postcard, p. 151



Conveyer lubricator is designed for foundries

Having enclosure especially designed for foundries or any operation where an unusual amount of dirt, dust, spray circulates, an automatic lubricator is a self-contained grease type unit driven by contact with the trolley wheels. As the trolley wheel approaches lubricator, the hub engages sleeve of one of the five pumping units. Continued rotation of the lubricator forces the pumping unit inward, delivering a measured quantity of lubricant to the wheel bearing. *J. N. Fauver Co., Inc.*

For more data insert No. 21 on postcard, p. 151

Huge shovel loads 50-ton truck in four passes

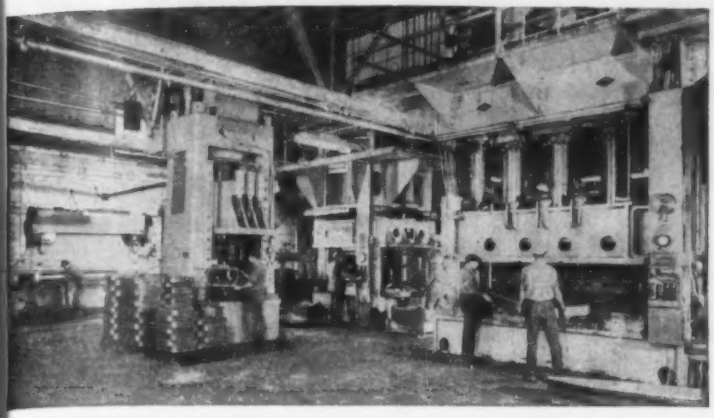
A new 10 cu yd mining and quarry type machine described as the world's largest, most powerful shovel on two crawlers has many impressive performance features. The heavy duty shovel has small-machine cycle time; more strength and more power in terms of digging effort and speed per cubic yard of capacity. Maneuverability is said to be greater than most small machines. Basically a full electric machine, it can be furnished as an all diesel-electric. *Marion Power Shovel Co.*

For more data insert No. 22 on postcard, p. 151

Turn Page

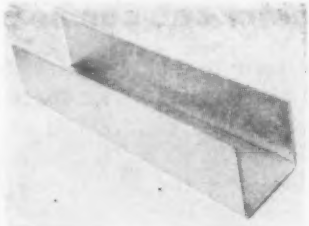
Creative METAL STAMPINGS

from "MIGHTY BIG" presses



Above, *left to right: Dreis and Krump Press Brake, ¼" x 120" capacity; 750 ton single action Williams-White hydraulic press, 60" daylight opening, bed area 48" x 96", equipped with hydro-pneumatic cushion; 2500 ton single action Lake Erie hydraulic press, 48" daylight opening, bed area 120" x 59" equipped with spring cushion; 750-250 ton double action Marion hydraulic press, daylight opening 69", bolster area 120" x 60", equipped with hydraulic cushion.*

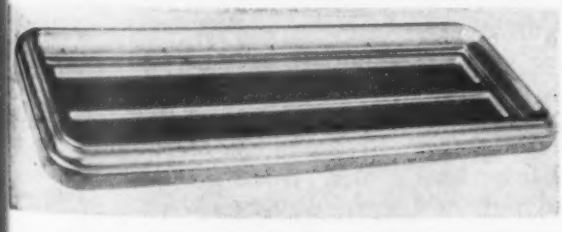
Right: *Triple action Clearing hydraulic press, 750 ton ram capacity, 400 ton blankholder, 250 ton 3rd action, bolster area 150" x 72", daylight opening 94", stroke of ram 66", equipped with hydro-pneumatic cushion.*



½" thick x 39⅛" long x 8⅝" wide x 9⅜" deep. Weight 125 lbs. ➤

20 gauge x 46" long x 42" wide x 10" deep. Weight 22 lbs. ➤

18 gauge x 83" long x 28" wide x 4" deep. Weight 75 lbs. ➤



These giant presses are just a few of the many modern production machines at the Leake Stamping Company. Also available are numerous medium sized and small, high speed presses as well as complete supplementary facilities for heat treating, brazing, welding, carburizing, machining and testing. Equally important, Leake engineers are widely experienced in solving tough pressed metal problems, often involving the complete redesign of parts previously made by other production methods to adapt them to pressed metal fabrication.

This valuable experience is available to you for the asking. If you have parts that you feel might be made better or more economically from pressed metal, send samples or drawings to Leake engineers. They will investigate the possible advantages of the use of pressed metal in your particular problem. If pressed metal cannot readily be applied to your particular part, they will be frank in telling you so. If, on the other hand, your part is applicable to this modern production method, Leake will be glad to design and furnish quotations covering your requirements.

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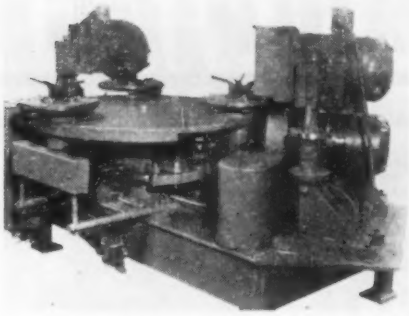
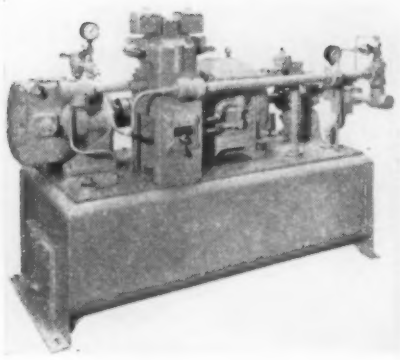


Machine can deburr 525 ring gears per hr

A ring gear deburring machine is arranged for one unloading and loading position and two brushing stations. Each brushing station brushes top and bottom of the gear teeth. Quick acting chucks permit the operator to unload and load the gears at the rate of 6 to 7½-sec cycle. Movements of the machine are automatic and fitted with a time relay to adjust the timing of the cycle. The chuck in the loading position is held stationary while loading and starts revolving before it gets to the brushes. *General Riveters, Inc.*

For more data insert No. 23 on postcard, p. 131



Packaged power modernizes presses

A packaged, oil hydraulic power and control unit has been designed for conversion of older, slow-speed hydraulic presses and extrusion machines to the higher speeds required by modern production. Units incorporate high-low pressure and volume construction, with a pressure compensated high pressure circuit to hold pressure cycle at exact speeds desired. The machine operator can get needed cylinder speed quickly, and by manual controls alter pressing or extruding speed as job indicates during operation. Built to meet JIC specifications, the unit includes electric controlled valving, decompression unit, micronic filters, and large oil reservoir tank. Sizes range to 125 hp at 5000 psi. *Rucker Co.*

For more data insert No. 24 on postcard, p. 131

All-weather tractor cab can be assembled in 2 hr

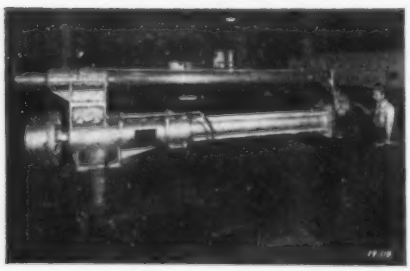
Shipped in knock-down form to the user, a new low-cost tractor cab assembly for the Mercury line of heavy-duty gasoline tractors is designed for quick installation in the field. It can be assembled by two men in approximately 2 hr. Twenty-four bolts secure the unit to the tractor frame. Features include: a 40x16-in. shatter-proof windshield of safety glass, an electric windshield wiper, canvas roll-down curtains, celluloid slide and back windows, and a 12-gage all-steel body. *Mercury Mfg. Co.*

For more data insert No. 25 on postcard, p. 131

Corrugated box wraps up 2800 lb metal products

Packing nearly a ton and a half of material in one complete, practical unit for safe, sure shipment is now possible with the new Pallet Pak. Packing and shipping costs are said to be reduced and customer complaints are cut to practically nothing. A bottom stitched cap is stitched to an inner liner. Top stitched cap slips over inner liner to form an exceptionally rugged unit. Thus top and bottom edges have triple reinforcement with double reinforcement at center of side walls. Pallet Paks can be wired to expendable four-way entry wooden pallets for economical loading in trucks and freight cars. They tier three high. Different unit assemblies can be packaged in same box. *Hinde & Dauch Paper Co.*

For more data insert No. 26 on postcard, p. 131



Hydro-Arc electrode arm holds 20-in. electrode

This is one of six large automatic electrode holders built for a large producer of electric furnace steels. It permits automatic slipping of electrodes and consequently reduces the furnace downtime. The furnace on which this holder is used is a 70-ton top charge type energized by a 20,000 kva furnace transformer. The graphite electrodes have 20-in. diam and carry 40,000 amp, 60 cycle ac to furnace by the transformer. *Whiting Corp.*

For more data insert No. 27 on postcard, p. 131

Turn Page

FOR PIECEWORK OR PRODUCTION-LINE OPERATION

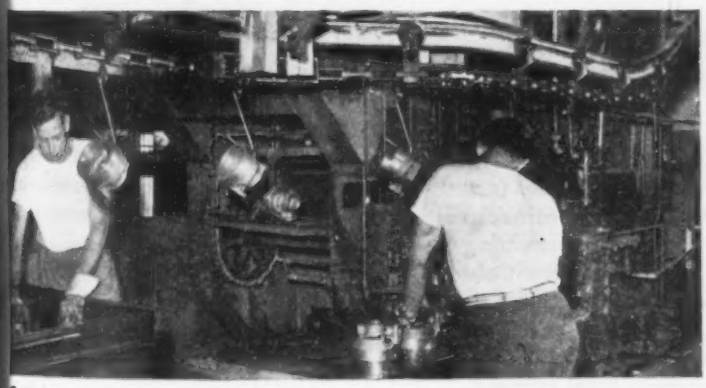
VAPOR DEGREASING

GIVES YOU SPEEDY, EFFICIENT METAL CLEANING

...MANUALLY OPERATED

A vapor degreaser is ideal for cleaning small parts. Equipment is simple, timesaving and easily operated.

...CONVEYORIZED



Cast iron compressor blocks for refrigerator units are carried by conveyor through a vapor degreaser. Conveyor systems are frequently used in vapor degreasing to maintain high production in larger scale operations, or when heavier parts are being handled.

Any size or shape part, no matter how intricate, is thoroughly cleaned by vapor degreasing with Du Pont "Triclene" D Trichlorethylene. Parts come out clean, warm and dry, instantly ready for the next operation. And the heaviest oils and grease are often removed in less than a minute!

Compact, efficient vapor degreasing equipment is available to meet a wide range of production capacities. Whatever the type unit, "Triclene" D is recommended to give you the best possible performance. With it comes Du Pont service and an experienced organization to assist your metal cleaning program.

"Triclene" D has been used for metal degreasing for many years by thousands of plants. It's the most stable, the best, degreasing solvent we know how to make. It stands up under moisture, air, heat and other destructive influences which may be found in degreasing.

"Triclene" D is so pure that control and maintenance of degreasing operations are easy and economical. And it's readily recovered for re-use from sludge and residue because of its narrow boiling range.

The coupon below will bring you the facts about vapor degreasing with "Triclene" D.

Mail the coupon below for more facts on vapor degreasing.

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Please send me detailed information on Vapor Degreasing: applications, advantages, equipment used, and Du Pont solvents available. We are interested in cleaning _____ products.

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Follansbee Cold Rolled Strip Steel is manufactured to specifications, in tempers and finishes for most industrial applications. Let the nearby Follansbee Representative tell you about Follansbee Steel Service, tailored to fit *your needs.*

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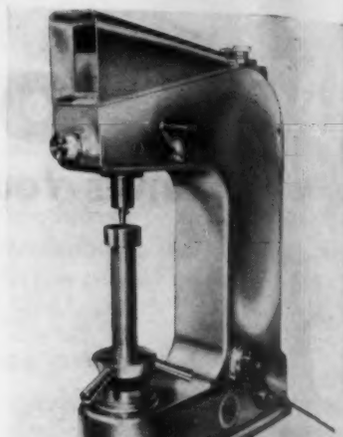


Hardness tester

The Galileo hardness tester gives hardness measurements following the Rockwell method, on any type metal in the Rockwell A through F scales by direct reading. Operation of the tester is simple and readings are easily taken. The tester makes use of a lever arm supported on knife edges and projects a magnified image of the hardness reading on a screen. This optical balance maintains its calibration over extended time intervals and is highly accurate. The tester can also be adapted to special tests and Vickers measurements. *Metallurgical Instrument Co.*

For more data insert No. 28 on postcard, p. 181

Stainless tops

Stainless steel tops for laboratory furniture fit basic models of Unitized laboratory furniture. Each top, supported by thick plywood sections is made in one piece with an integral splash-back and reagent shelf. The stainless steel used contains over 30 pct nonferrous alloying materials, making it resistant to the action of common laboratory reagents. Edges are a continuation of the upper surface and adjacent edges are welded. Front edge is rolled for protection of laboratory worker. *Fisher Scientific Co.*

For more data insert No. 29 on postcard, p. 181

Scale free piping

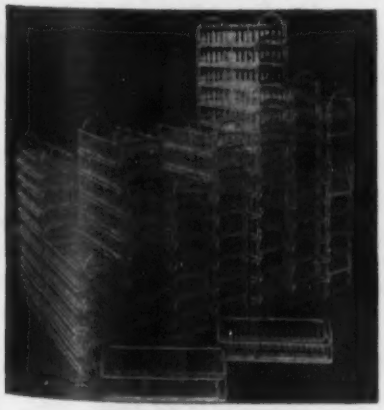
A new product, the Tube-Turn SF welding coupling makes it possible to eliminate damaging welding scale from piping systems. The coupling consists of two forged halves, with ends of the hubs prepared for welding to pipe or welding fittings of corresponding sizes. When the two halves of the coupling are brought together, the tongue of one slips into the groove of the other. A circumferential cavity directly beneath the beveled welding area prevents burn-through or the formation of icicles in the interior. The cavity also insulates the interior from the extreme welding heat and prevents scaling. Sizes range from 1¼ to 12 in. in carbon steel, stainless, aluminum and other metals and alloys. *Tube Turns, Inc.*

For more data insert No. 30 on postcard, p. 151

Wire baskets

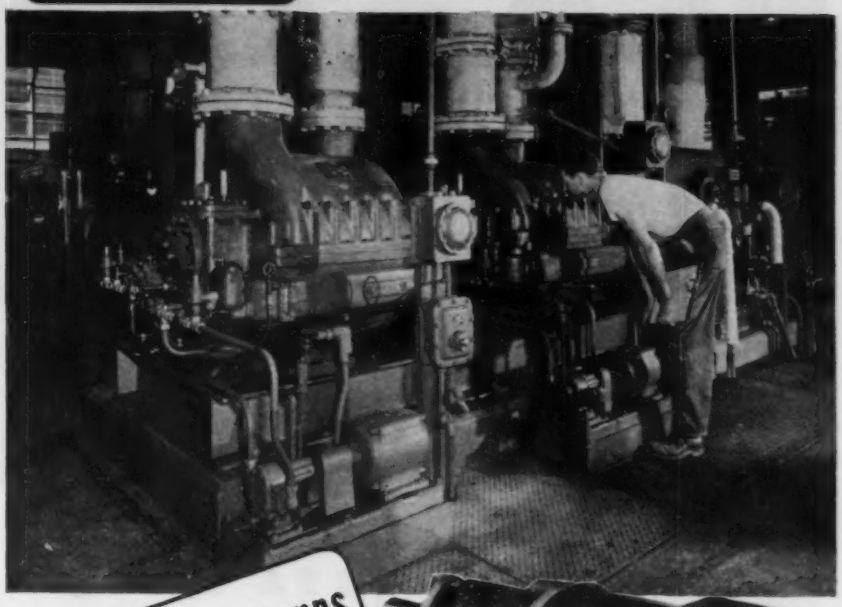
This new carrier known as the Eezy-Stak wire basket consists of a metal frame and custom-made inserts that handle any shape or material. It protects highly-machined finished parts, decal and plated parts against abrasion. Baskets are made of ⅛, ¼ and 5/16 in. steel wire, ¼, ½, and ¾ in. flat expanded metal, or wire mesh or perforated metal. All types are cadmium plated, lightweight, easy to handle, store and stack, and extremely durable and long lasting. For especially fragile parts, Eezy-Stak baskets are available with a rubber or plastic coating. *Wire & Iron Products, Inc.*

For more data insert No. 31 on postcard, . 151



Turn Page

ROPER Rotary Pumps
All Ways Dependable
SINCE 1887



2 Series "K" Pumps take this Pressure Lubrication Job in Stride

When Sun Oil Co. installed these Clark Compressors in their Marcus Hook Refinery, they were assured greatest dependability and efficiency from all components. For good reason! These compressors must work steadily to keep pace with ever increasing demands for petroleum products. That means the two Ropers — operating in the capactiy of pressure lubrication — have a tough tour of duty as well. But, Ropers are rugged, so they take their gruelling job in stride.

REASONS WHY ROPERS ARE PUT ON THE JOB... AND STAY ON THE JOB! The above example is one of varied installations where Roper Series "K" Pumps serve best. This series is also adapted to hydraulic service, fuel supply, or transfer work pumping clean liquids. Series "K" pumps are self-priming, operate in either direction with equal efficiency, handle total suction lifts up to 25 feet. Roper's venturi and discharge principle, plus helical gears and shafts of hardened steel; accurately fitted bronze bearings; and compact, rugged housing all add up to dependability that keeps these pumps on the job. Series "K" pumps come in ¾ to 50 g.p.m. sizes; pressures to 150 p.s.i. Send for full details.

ROPER
GEO. D. ROPER CORPORATION
112 Blackhawk Park Avenue
ROCKFORD, ILLINOIS
ROTARY PUMPS

if

your product calls for **trouble-free power transmission** it calls for · · · · ·

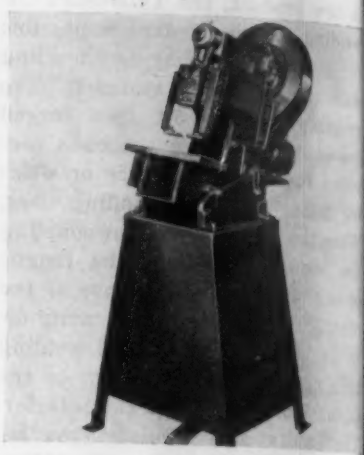
Perkins *custom-made* Gears

PERKINS MAKES TO CUSTOMERS' SPECIFICATIONS IN ALL MATERIALS, METALLIC AND NON-METALLIC: *bevel gears, ratchets, ground thread worms, spiral gears, worm gears, helical gears, spur gears with shaved or ground teeth.*

Perkins Machine & Gear company
west springfield
massachusetts

—New Equipment—

Continued



Press tilts 25°

A small, powerful inclinable punch press is an open back machine with flywheel to the rear rather than at the side. This out-of-the-way location provides a greater margin of safety as well as more elbow room when feeding stock into the press. The No. 127 is a high speed unit rated at 275 strokes per min and has a capacity of 5 tons. A positive non-repeat clutch can be released for automatic feed. Throat depth is 6 in.; height of throat, 7 in.; length of stroke, 1 in. with stroke adjustment of 1¼ in. Die space is 5¾ in., with stroke down and adjustment up. *Whitney Metal Tool Co.*

For more data insert No. 32 on postcard, p. 151

Speedy bright finishing

With a special purpose chemical compound for barrel finishing alloy steel parts and any generally used tumbling medium, bright mirror finishes can be put on steel parts in time cycles of 20 to 40 min. The compound can be used in certain applications for roughing and finishing to produce low microinch surface readings, true color and uniform results. No. C-5 is non-dusting, soapy, concentrated powder that has no obnoxious odor and is not irritating to the skin. Detergency and rinsability are outstanding characteristics. *Blue Magic Chemical Specialties, Inc.*

For more data insert No. 33 on postcard, p. 151

Brazing pre-forms

The PresSint job-fitted brazing or silver soldering pre-form represents the arrival at a new goal in certain metal joining operations, through the medium of powdered alloys. This is made possible by the development of fast acting brazing fluxes, suitable in form, temperature, and fluxing characteristics for direct mixing with powdered alloys. The pre-form is designed for one particular application. An alloy and a PresSint flux best fitting the job requirements are compounded in a ratio and a pre-form shape to yield optimum end results. *PresSint Products.*

For more data insert No. 34 on postcard, p. 151

Die handling unit

A power winch mounted in the battery compartment of Baker JOM series for trucks turns the trucks into die handling machines without interfering with their hauling and tiering efficiency. All parts of the winch except reels and cables are enclosed in the truck's battery compartment. For die pulling, hooks on the winch cables are attached to the die. Then power is applied to the winch to pull the die onto the forks. *Baker-Raulang Co.*

For more data insert No. 35 on postcard, p. 151

Self-locking nuts

A new self-locking anchor nut has a flanged anchoring portion integral with a thin-walled drawn shell that is fully tapped throughout its length. Made of high carbon annealed spring steel, the nut is crimped and then heat treated to provide an extremely strong flexible threaded portion that resiliently grips the bolt within the span of the normally required number of threads, without necessitating an auxiliary locking device. For this reason it is lower in height than existing comparable lock nuts and because of its high strength, is said to be lighter than comparable anchor nuts. Made to Army and Navy Air Corps specifications. *Kaynar Mfg. Co., Inc.*

For more data insert No. 36 on postcard, p. 151

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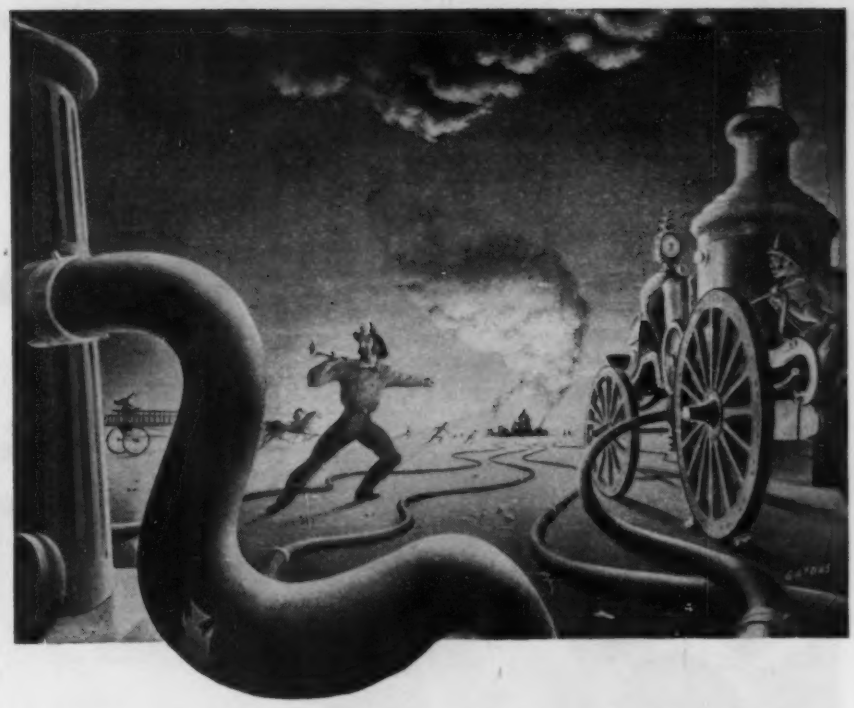


STILL BEST AT BLAZES

Until 1872, fire hose deteriorated faster in storage than when battling blazes. Then Hewitt-Robins perfected a hose whose tough fabric plies were chemically impregnated (*or carbolized*) against mildew and dry rot, mortal enemies of conventional hose.

It was called Maltese Cross® Fire Hose. The Maltese Cross made today is still unequaled for long life and unfailing performance. No Maltese Cross Fire Hose has ever burst at a fire; some installations are still in service after forty-five years.

The carbolizing process is a Hewitt-Robins "first"—one of many Hewitt-Robins contributions to industrial hose life and efficiency.

Today, among our 1000-plus types of natural and synthetic rubber hose, there are custom-designed fire hoses for industrial, municipal and marine fire protection . . . for water, foam, chemical or booster service. Whether wrapped, jacketed, rubber-covered or molded-and-braided, each reflects almost a century of hose-building experience . . . *each is right for the job.*

For fire hose . . . *for industrial hose of any kind* . . . get in touch with Hewitt-Robins.

HEWITT HR ROBINS

Executive Offices: 370 Lexington Avenue, New York 17, N. Y.

HEWITT RUBBER DIVISION: Belting, hose and other industrial rubber products
ROBINS CONVEYORS DIVISION: Conveying, screening, sizing, processing and dewatering machinery
ROBINS ENGINEERS DIVISION: Designing and engineering of materials handling systems

Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation

SHENANGO Centrifugal CASTINGS ... KEY TO SAVINGS

These ram pistons, centrifugally cast of Meehanite Metal for 300-ton hydraulic press, must withstand 4,000 p.s.i. Completely machined and assembled by Shenango.

Teamed up for longer life under pressure

SHENANGO CENTRIFUGAL CASTINGS OF MEEHANITE METAL

FOR pressure service . . . for almost *any* severe service . . . it's hard to match Shenango *centrifugally* cast Meehanite Metal.

First, Shenango's centrifugal process means a uniform, high-strength, pressure-dense casting, free from sand inclusions, blow holes and other defects. Next, in Meehanite Metal you have finer graphite flakes, always more evenly dispersed, thus avoiding stress concentrations and permitting a finer finish.

So here's a combination you just can't beat for wear-life . . . for resistance to abrasion, pressure or shock . . . for long-range *economy!*

If *your* plans call for essentially symmetrical parts, large or small, rough, semi- or finish-machined, check with Shenango. Get *all* the facts! Informative bulletins are yours for the asking.

SHENANGO-PENN MOLD COMPANY
Dover, Ohio
Executive Offices: Pittsburgh, Pa.

SHENANGO

ALL RED BRONZES • MANGANESE BRONZES • ALUMINUM BRONZES
MONEL METAL • NI-RESIST • MEEHANITE METAL

Die shop reamers

Sets of die shop reamers range in size from a set of 11 helical die makers reamers No. 1 through No. 11, to a set of wire gage chucking reamers No. 1 through No. 60. Sizes through 5/16 are ground from the solid. All reamers have external centers and ground flutes. *Lavallee & Ide, Inc.*

For more data insert No. 37 on postcard, p. 18

Motor watchman

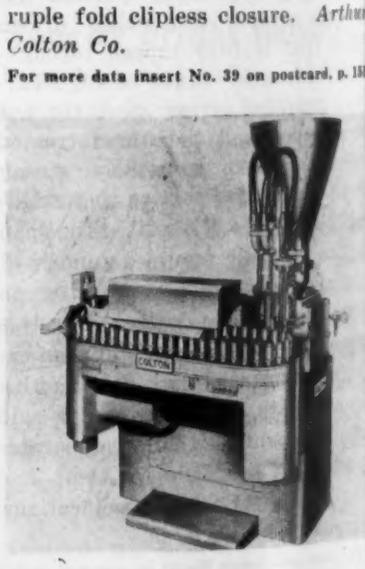
NEMA size 0 and 1 manual motor starters with built-in indicating lights are mounted in NEMA type I enclosures, and designated as class 10-100-S1 and 10-100SOA. The indicating light generally is used to show whether the starter is on or off, but it can be wired into the circuit to indicate other conditions. The light can be provided for ac voltages of from 110 to 600 v. *Westinghouse Electric Corp.*

For more data insert No. 38 on postcard, p. 18

Tube filler and closer

An automatic tube filler and closer handles up to 1¼ in. diam tube in twin filling and up to 1¾ in. diam tube in single filling. Tubes are filled from the bottom up to prevent air pockets. The fill is a metered quantity delivered by gravity feed from a 15 gal hopper. Tubes are closed on the machine by a quadruple fold clipless closure. *Arthur Colton Co.*

For more data insert No. 39 on postcard, p. 18



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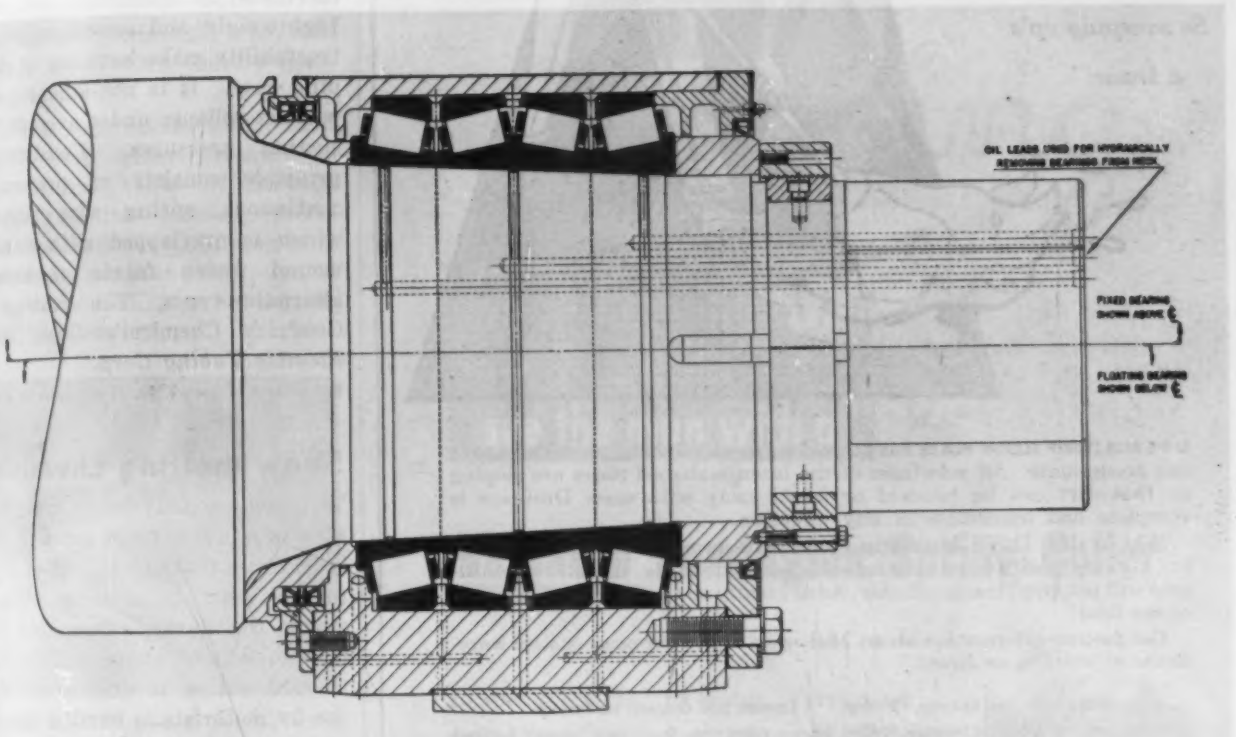
NEW TIMKEN® 4-ROW BEARING FOR ROLL NECKS HAS TAPERED BORE!



Combines interference fit with easy removal!

THE Timken Company pioneers again in roll neck bearing design. This time by offering for high-speed mills a 4-row tapered roller bearing that combines maximum bearing capacity and interference fit with easy removal! The new Timken® bearing has a tapered bore—long used in 2-row bearings, but now developed and introduced in 4-row bearings for the first time.

It's the greatest development in roll neck bearings since the Timken Company pioneered the first balanced proportion bearing in 1941.

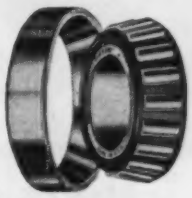
Like other Timken roll neck bearings this new tapered bore bearing permits maximum roll neck size and greater mill rigidity, eliminates need for special thrust bearings, makes possible higher rolling mill speeds, permits stopping and starting of mills without loss of steel.

For additional information on the new 4-row tapered bore roll neck bearing, write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⊂⊃ THE TIMKEN TAPERED ROLLER ⊂⊃ BEARING TAKES RADIAL ⊂⊃ AND THRUST ⊂⊃ LOADS OR ANY COMBINATION

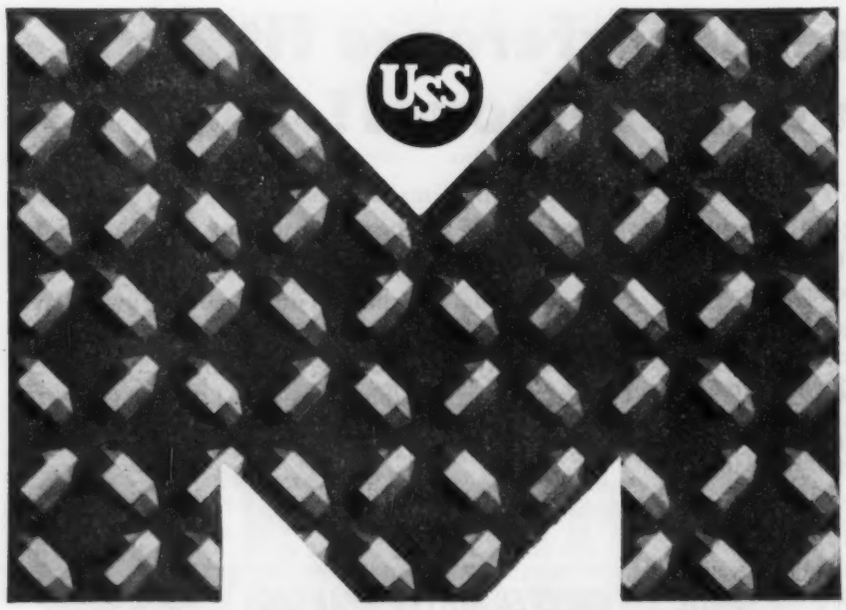
"The mop detail
dotes on this floor,
It drains so fast
with ease.
And dirt can't stick
on Multigrip
So sweeping up's
a breeze!"

U·S·S MULTIGRIP FLOOR PLATE has no pockets in which dirt, grease and water can accumulate. All side faces of the lozenge-shaped risers are sloping so that dirt can be brushed or hosed away with ease. Drainage is complete and immediate in any direction.

Wet or dry, U·S·S Multigrip Floor Plate provides safe, sure footing for workers, positive traction for vehicles. And sturdy, *permanent* Multigrip will not chip, crack, splinter. Adds greatly to the structural strength of the floor.

Get further information about Multigrip from your nearest steel warehouse or write to us direct.

United States Steel Company, Pittsburgh · Columbia Steel Company, San Francisco
Tennessee Coal, Iron & Railroad Company, Fairfield, Ala. · United States Steel Export Company, New York
United States Steel Supply Company, Warehouse Distributors, Coast-to-Coast



U·S·S MULTIGRIP FLOOR PLATE 1-1145

UNITED STATES STEEL

—New Equipment—
Continued

Flexible fabric tubing

Spiratube, a new flexible fabric tubing for ventilation and product handling is offered with vinyl plastic coating that gives good abrasion resistance for rough handling, and inertness to chemicals and oils. Lightweight and accordion-like retractability make handling or shipping easy. It is non-kinkable and will not collapse under average fan suction pressures. Construction principle consists of preformed, continuous, spring wire ribbing, which is overlapped with spirally wound woven fabric of several alternate types. The coating is Goodrich Chemical's Geon latex. *Flexible Tubing Corp.*

For more data insert No. 40 on postcard, p. 151

Snow melting chemical

Thawing capacity of 1 lb of Ice-Rem is reported to be approximately 30 times that of salt. Used prior to the start of a snow or sleet storm, the chemical compound will melt subsequent snows until its exothermic action is exhausted. For use by motorists, a handful thrown under each rear car wheel provides needed traction and stops wheel spinning. *Speco, Inc.*

For more data insert No. 41 on postcard, p. 151

Emergency showers

Emergency showers have been designed to utilize the most modern techniques of spraying water to rapidly quench fire, or in a matter of seconds dilute and remove acids or other chemicals and foreign materials contaminating clothing or the human body. Three basic models meet the requirements of maximum, medium or minimum exposure. High corrosion-resistant red brass is used for all functional parts, assuring maximum workability and efficient operation at all times regardless of whether showers are used in plant or laboratory, on docks or in the field. *Logan Emergency Showers, Inc.*

For more data insert No. 42 on postcard, p. 151

Sluice Mining:

Plastic pipe successfully used in Arizona mining operation . . .

Plastic pipe is being successfully used in an unusual sluice mining operation near Wickenburg, Ariz. Universal Mineral Recoveries is using 2-in. and 6-in. Carlon pipe to recover gold, silver, lead and other minerals from mill tailings left by 19th century operators.

In this operation, 2-in. diam pipe is used under pressure to undercut the banks of tailings to facilitate the recovery procedure. The material containing mineral deposits then is pumped through the 6-in. pipe to the recovery equipment.

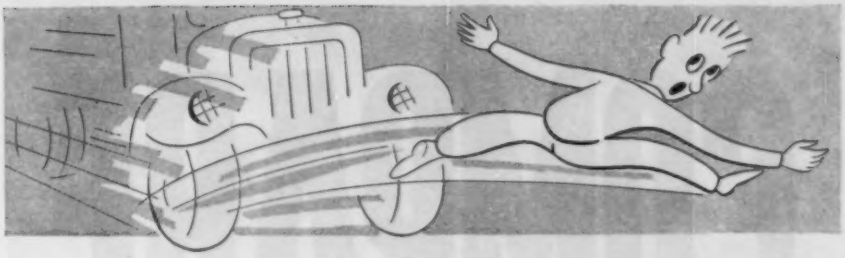
FLEXIBLE PLASTIC used in Arizona sluice mining operation resists corrosion and rot.

Eight-hundred feet of plastic tubing is being used as conduit for the electric wires to the 60-hp motor powering the dredge pump and has proved to be far superior to other underwater insulation.

Properties of plastic pipe make it particularly suitable for this type of installation. Possessing complete immunity to rot, rust and electrolytic corrosion, it withstands the adverse conditions encountered in sluice mining operations.

It provides maximum resistance to corrosive fluids and soils, and the smooth internal surface does not accumulate scale or sediment.

Supplied in lengths up to 400 feet, its flexibility permits it to follow uneven surface contours. The plastic pipe is light in weight and easily installed.



For the spring of your life

see the man with a

Versatile Torrington Spring Coiler

In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.

MODEL W-11 SPRING COILER
The 14 different Torrington Spring Coilers cover a range of wire diameters from .003" to .750".

SPECIFICATIONS
of the Model W-11 Spring Coiler

Wire diameter range: .015" to .072"

Wire Length per Spring: 0" to 42" (Extra Wire Feed Gears Available)

Coil Range (O.D.): 3/32" to 1-9/16"

Production: 23 to 190 springs per minute with variable speed drive.

Torsion and other attachments are available.

The TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

COMPARE

your present ALUMINUM FINISHING PROCESS with these advantages of IRIDITE® Al-Coat

—see for yourself why more and more finishers of aluminum products are specifying Iridite Al-Coat for any wrought, cast or buffed aluminum part.

1. IN PROCESSING

Faster—Just one simple dip, 10 seconds or only two minutes, depending upon your finishing specifications. No sealing dip, no special drying.

Simpler—Non-electrolytic, no heating or exhaust units, operates at room temperature. No special precleaning baths required.

2. IN APPEARANCE

Clear—Protects metal without changing its original appearance.

Colored—Heavier, iridescent yellow film provides greater protection.

3. IN PERFORMANCE

Corrosion Resistance—Up to 1,000 hours salt spray on wrought stock, 250 hours on castings. Approved under government specifications.

Abrasion Resistance—Will not flake or peel from buffing, bending or scraping.

Paint Base—Blocks underfilm corrosion; grips paint, holds it firmly.

Welding—Finished surface can be spot welded, coating actually aids shielded arc welding.

Conductivity—Offers low surface resistance to electrical current.

4. IN COST

Comparative figures show that Iridite Al-Coat saves as much as 50% over other aluminum finishing processes. *Let us prove this to you.*

Write today for FREE SAMPLES of Iridite Al-Coat. Or, send samples of your product for test processing.

Iridite is approved under government specifications.

ALLIED RESEARCH PRODUCTS
INCORPORATED
4004-06 E. MONUMENT STREET • BALTIMORE 5, MD.

REPRESENTATIVES IN PRINCIPAL INDUSTRIAL CITIES; West Coast: L. H. BUTCHER COMPANY
Manufacturers of Iridite Finishes
for Corrosion Resistance and Paint Systems for Non-Ferrous Metals; ARP Plating Chemicals.

—Technical Briefs—

Continued

ASM Meeting:

Strategic metal conservation to be discussed at Jan. 31 meeting

Five aspects of strategic metal conservation and substitution will be discussed by top experts at the first midwinter technical meeting of the American Society for Metals to be held in Pittsburgh Jan. 31 and Feb. 1.

Titanium and titanium alloys will be considered in four papers scheduled for Jan. 31. During the afternoon session five papers covering embrittlement of both iron and steel will be presented. In an evening session discussion will center on high temperatures and oxidation.

Nonferrous metallurgy will be the subject of the Friday morning session. The afternoon session will deal with transformation and grain size.

Spray Forming:

Simple, low-cost process forms high-melting point metals . . .

A new spray-forming technique for fabricating large complex parts of high melting point metals has been developed as a byproduct of Navy Bureau of Ordnance Research.

M.I.T. scientists first uncovered the process by which a sprayed-metal deposit is built-up. Using this knowledge they evolved a new process for forming high-melting-point metal parts by first spraying the metal onto a core of the desired shape, then sintering the sprayed deposit to form a dense, strong, metal part.

This new method is considered to provide a simple, inexpensive process for forming high-melting point metal parts, especially large, complex shapes that are difficult to fabricate by the conventional processes of powder metallurgy, precision casting, or die forging. High-melting point alloys as well as elementary metals can be formed by the new process.

Diamond Dust:

Collection of valuable material from grindings difficult . . .

Collection of valuable diamond dust from dust of dry-grinding operations poses a problem. The cost of separating the specks of diamonds from large amounts of miscellaneous dust in the general collection system is very high.

A solution to this problem recently advanced by the Aget-Detroit Co. of Ann Arbor, Mich., is a unit dust collector. Set up near the grinder, it collects only the diamond-containing grindings.

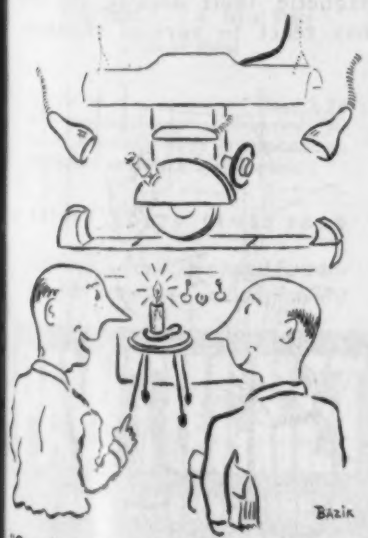
A motor-driven fan, a cyclone separator and a specially compressed, fiberglass filter are incorporated in the unit.

This type filter removes dust down to 0.2 microns.

Usually the collector is supplied with a single 4 in. inlet. This connects to 4 in. flexible fabric hose and terminates in a hood-type nozzle placed in line with the wheel.

A small percentage of the finest dust that may escape the cyclone separator is found in the filter compartment.

When gathered diamond dust is to be removed from the collector, this extremely fine dust is quickly swept back down through the cyclone. A hand shaker crank on the filter removes the microscopic particles.

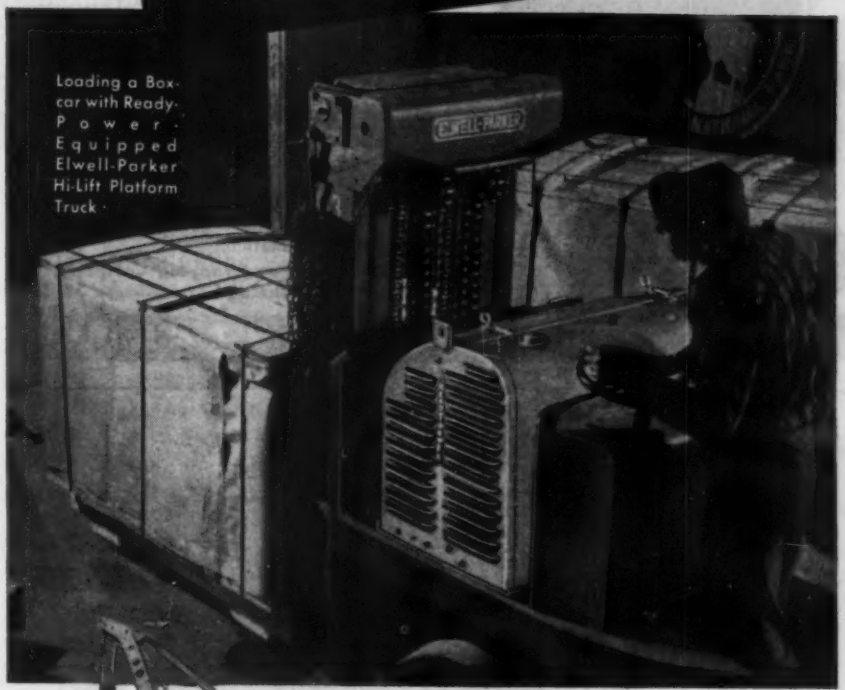


"Our plant engineer is a bug on adequate lighting."

for CONTINUOUS ELECTRIC POWER

Diesel-Electric Locomotives

READY-POWER-equipped ELECTRIC-TRUCKS

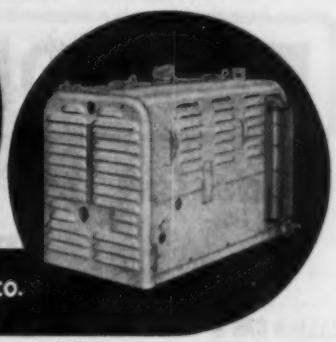


Loading a Box-car with Ready-Power Equipped Elwell-Parker Hi-Lift Platform Truck

Yale Crane Truck Equipped with Ready Power

Modern Diesel-electric locomotives and Ready-Power-equipped electric trucks operate alike. Both generate dependable electric power right on the vehicle; both operate economically; and both excel where long, continuous operation pays off. Your electric trucks will do more work at less cost when equipped with Ready-Power. There are models for every type, size and make of electric truck.

Ready-Power-Equipped Automatic Fork Truck



THE READY-POWER CO.

3822 Grand River Ave., Detroit 8, Michigan

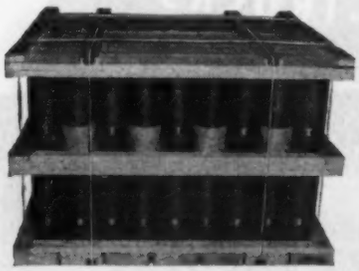
Can we help you with defense orders?

GERRARD ROUND STEEL STRAPPING

complies with packaging specifications

JAN-P-106 A, JAN-P-107 and JAN-P-108

● Take advantage of Gerrard's years of experience in packaging when you face the problem of packing defense orders. Gerrard Round Steel Strapping complies fully with joint Army-Navy specifications JAN-P-106A, JAN-P-107 and JAN-P-108 for overseas packing.



These shells were easily and securely tied to a pallet with Gerrard Round Steel Strapping.

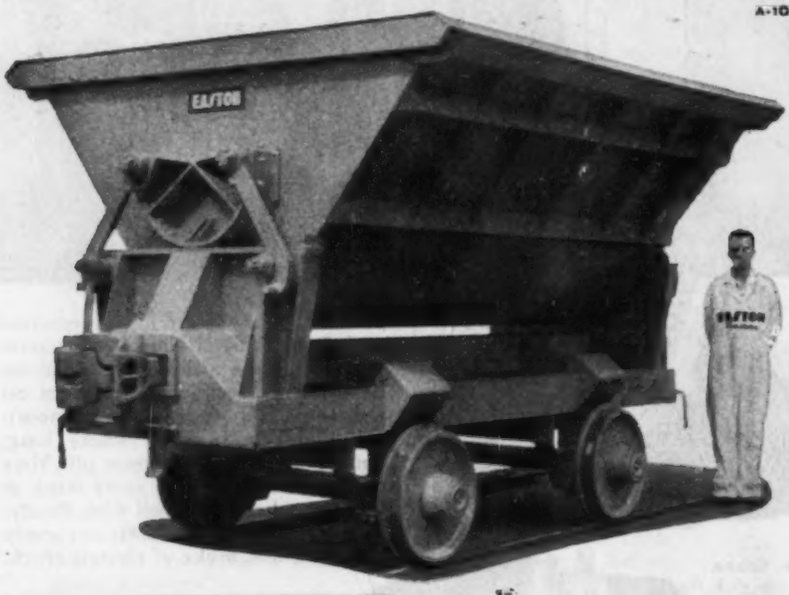
A Gerrard engineer can help you with your packaging problems. He can assist you to plan boxes and cartons that conform to specifications, and at the same time help you to make the best use of the steel strapping available for packaging. Where practicable, our engineer will demonstrate the advantages of using Gerrard Steel Strapping for bundling, palletizing, or securing packages with the Diagonal Tie.

Orders for defense requirements receive preference in delivery according to current regulations. Strapping available for non-defense orders is being equitably distributed among our customers. Phone, write or wire for further information.

Gerrard Steel Strapping Company, 4705 South Richmond St., Chicago 32, Ill.

UNITED STATES STEEL

A-1028



EASTON ...a dependable design and construction service in industrial cars

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA. • NEW YORK • PHILADELPHIA • PITTSBURGH

Technical Briefs

Metals Identification:

Rapid spot testing of metals and alloys described . . . Tests simple

Rapid spot testing of metals and metal alloys is a must in the present scrap drive. A series of simple tests and procedures by which more than 125 of these may be identified are described in a booklet published by the International Nickel Co., Inc.

The thousands of tons of nickel and other strategic materials recovered during World War II taught a salvage lesson that industry continued to remember after the end of hostilities.

Most plants have maintained rigidly controlled systems of scrap segregation and sorting. Despite care, however, mixups are bound to occur. Simple tests which can be made on the spot are useful in recovery of metals.

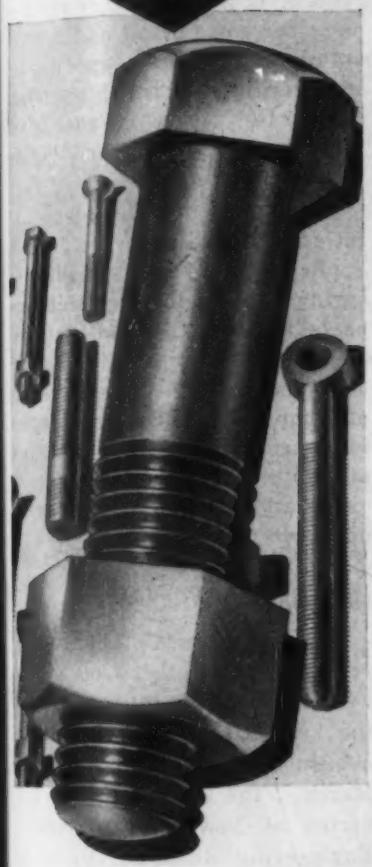
Simple tests for identification of nine wrought white metals and alloys in general use, including nickel, Monel, Inconel, Incoloy, cupro-nickel, and several types of stainless steel, all of medium density, are described.

Equipment for identifying the metals is simple, consisting of hydrochloric acid, potassium ferricyanide, nitric acid, distilled water, a medicine dropper and a magnet.

Identification is generally provided by segregation on a basis of whether or not the metals are magnetic, their density, and how they react to various chemicals.

"This the size nail you're looking for?"

First for
BOLTS
NUTS
STUDS



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Boron Steel:

Two million tons to be produced this year . . . 10 million in 1953

Boron steel, in which an ounce of boron may replace as much as 20 lb of critical alloying materials, is becoming a major tonnage product, according to a report by Arthur D. Little, Inc.

Supplies of the standard alloying elements—nickel, molybdenum, manganese, and chromium—are scarcer now than during World War II because military products require vastly increased output, still better performance, and lighter weight.

As a hardening agent, boron, in amounts less than a few thousandths of a pct, can replace several hundred times its weight of manganese, chromium, molybdenum, and nickel.

A boron-containing steel may be easier to process by machining, forging, or cold-working than the higher alloy steel which it replaces. The boron does not, however, impart better resistance to corrosion, wear, or high temperatures, for which many standard alloy steels are designed, according to the report.

When ordinary steel containing iron and carbon is heated and quenched, it becomes hard, but only near the surface, unless the part is extremely thin.

Addition of alloying elements permits hardening to a greater depth in a part of a given size. Since the mid-twenties it has been known that addition of boron also increases the hardenability of steel, that is, the depth to which the steel can be hardened by heat treatment.

The first boron steel was made commercially in the late thirties, and since then about 400,000 tons have been produced for civilian use.

During World War II many items of military equipment, such as armor-piercing projectiles, armor plate, and gun and vehicle parts, were produced.

It is estimated that some two

Turn Page

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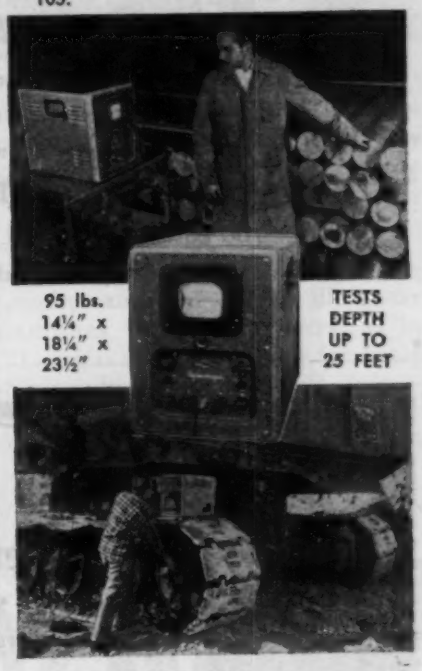

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million tons will be produced this year, and some authorities expect as much as ten million next year.

For most applications involving heat-treated parts, boron added to steels with low or medium carbon content is a satisfactory replacement for some or all of the other standard alloying elements; in stronger, less ductile, high-carbon steels, the boron is unsatisfactory, and the scarcer alloying metals must be used.

Resistance of boron steel to fatigue failure, important in such applications as axle spindles or springs, where the load shifts repeatedly and causes ultimate destruction of the part, is probably the same as in other alloy steels of comparable hardness. In notch toughness—resistance to failure at a notch, as in threaded parts or on rough surfaces—boron steel is adequate for most uses.

Heat Balance Studied

Causes of climatic changes and variations in weather from year to year are being sought in a study of the heat balance in the northern hemisphere during the month of March. The study is being conducted at New York University's Engineering Research Div. as an Air Force project.

Objective of this research is to determine the relative importance of radiation, and of transport of latent and sensible heat. The radiation deficit is calculated, and an analysis is made of the mechanism through which heat is replenished by transport.

Maximum radiative heat loss takes place about three kilometers above the earth's surface, and averages one degree per day. Both outgoing and incoming radiation at the top of the atmosphere is about 15 pct larger than had been previously estimated.

A better understanding of the roles of radiation and transport will contribute to basic information on the average air motion over a period of years.

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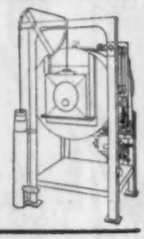

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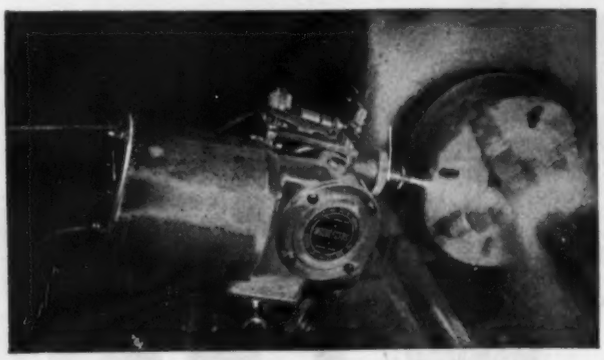

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Press Production Speeded

Higher production and lowe handling costs where press opera tions are involved have been pos sible through installation of con veyer systems which eliminate han dling of parts by press operators

Experience at the Soss Mfg. Co Detroit, makers of automobil hinges, show production was in creased 25 pct after a material han dling system was installed.

Heart of the system is the powe belt conveyer, in this case the Press Veyor. In one day of peak produc tion 38,000 assembled hinges were produced. Continuous movement o materials between machines elimi nated 400 shop trucks. Handlin costs were cut about one third.

The conveyers move the hinge to work-level hoppers at machine in successive operations on six pro duction lines. Controlled movemen ment prevents over-production a any work station.

AEC Patent Compensation Made

Design of an apparatus an method useful in separating iso topes of different mass has received the first award, $7500, of the U. S Atomic Energy Commission's Pat ent compensation board.

The award went to Cyril E. Mc Clellan and is the first made since the board was established in 1949 The new method makes use of th principle that the time of flight o ions of the same charge varies with the mass of the respective ions. A similar method, improved by the AEC staff, is being used in research measurements.

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—Technical Briefs—

Descaling:

Evaporator tubes in electric power station flex . . . Scale breaks off

To assure purity of makeup water in the 30,000 kw electric power plant, Hickling Station, at East Corning, N. Y., evaporator tubing flexes to provide positive thermal descaling.

Some 140 tons of water are changed into steam at 900°F every hour when the plant is running at full load. The feedwater is taken normally from deep wells and is softened prior to evaporation.

Performance tests have shown the evaporator will produce vapor containing not more than 0.5 parts per million of mineral solids. It is of the single effect type and has a capacity of 7000 lb of water per hr at 238.3°F. and 24.2 psia when steam is supplied at a pressure of 56.5 psia.

The flex-tube principle from which the Flex-Tube evaporator derives its name, refers to a positive thermal descaling action. Tubes are assembled in a straight position. By means of struts, tension bars and split support plates, the tubes bend or flex when heat is applied to the coil side.

When cold cracking water is sprayed over the tube bundle, the tubes rapidly contract and assume their original straight position. This movement causes scale to crack off the tubes and drop into the lower portion of the shell, from where it is flushed away through the blowdown openings.

Pittsburgh Ore Carrier Launched

The Pittsburgh Steamship Co.'s new ore carrier, *Philip R. Clarke*, was launched recently at the Lorain, Ohio, yards of American Shipbuilding Co. The 647 ft vessel has a breadth of 70 ft and a depth of 36 ft. First expansion of the company since 1943, it will join Pittsburgh's fleet during the 1952 shipping season.

The new ship is one of three ore carriers being built for Pittsburgh, a U. S. Steel Corp. subsidiary. Combined, the three ships will increase capacity by 57,000 gross tons per trip.

SPEED NUTS score "direct hit" on Globe Jet Target

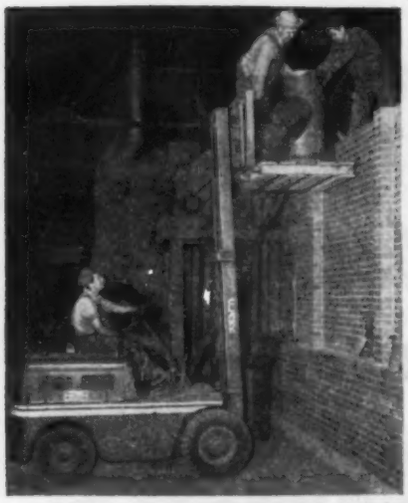
How SPEED NUTS "shot down" cost of assembly, saved time and ended vibration-loosening problems on Globe Jet Powered aircraft targets.

Speeds attained by the Globe KD2G-2 jet target are high enough to provide the realistic touch of actual air-to-air or air-to-ship attacks. This sleek craft is the result of over three years of development work by Globe Corporation, Aircraft Division, Joliet, Illinois, in cooperation with the Navy Department, Bureau of Aeronautics.

Globe engineers had to plan assembly of the target with fasteners that could take intense vibration. Of all those tested, Tinnerman SPEED NUTS made the biggest hit. *Not only did SPEED NUTS end vibration loosening problems, they also provided an average time-savings of 48% per application over other methods.*

Globe is justifiably proud of the jet target, one of the achievements that stands out in its 50th anniversary year. And Tinnerman is proud of its part in this success. Perhaps your company can use the valuable experience gained by Tinnerman on this and many other projects. Write for information on our comprehensive Fastening Analysis Service. TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. In Canada: Dominion Fasteners Limited, Hamilton. In Great Britain: Simmonds Aerocessories, Limited, Treforest, Wales.

SPEED CLAMPS attach hose to fitting of internal fuel line. Note low profile of one-piece clamp.
Tail cone is attached with 5 "U"-type SPEED NUTS which hold themselves in bolt-receiving position for blind assembly.
More than 23 SPEED NUTS are used in various locations on the KD2G-2 target. They must hold tight under vibrations created by the jet engine pulsating at 70 to 80 cycles per second, catapult shocks of 10 to 15 g s acceleration, and the impact of parachute landings at end of each mission.
"AN" receptacles on junction box are secured by SPEED NUT retainer rings.
TINNERMAN Speed Nuts*
FASTEST THING IN FASTENINGS



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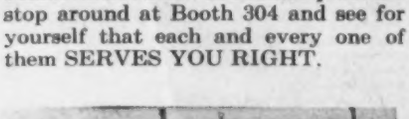
Take the CLARK fork-lift truck, for example: Gas-powered or electric battery-powered, it can be switched in a jiffy from handling materials to serving as a mobile shop elevator (see cut above). Or it can switch as easily into the role of an adjustable scaffolding for any kind of overhead work or repairs. Its ready adaptability makes it a valuable tool for grading, shoveling, snow removal, moving machinery—or for changing electric light bulbs! There's no end to its uses in the hands of an ingenious owner. Truly, it is the answer to the maintenance man's prayers, a joy to the efficiency expert, a boon to the safety engineer and the most profitable investment on the Treasurer's records.

SEE FOR YOURSELF . . . CLARK will exhibit and demonstrate some of its machines in January at the Plant Maintenance Show in Philadelphia. Do stop around at Booth 304 and see for yourself that each and every one of them SERVES YOU RIGHT.



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—Technical Briefs—

Cans for Engines:

Lightweight steel shells turned out by assemblyline methods . . .

Assemblyline methods are being used at the Dunkirk Plant of American Locomotive Co. to produce the lightweight "cans" used to protect airplane engines during shipping and storage.

Although hundreds of containers are turned out every week, they are carefully engineered and fabricated to meet stringent Air Force requirements. The container must provide a barrier against water, dust, air, dirt and moisture without separately applied sealing compounds or materials.

Shock mounting capable of protecting a heavy engine from vibration, impact, dropping, and rolling over must be provided. Other musts include a humidity indicator, desiccant holder and skids.

Because of the large quantities needed and the precision required in fabrication, mass - production techniques—combined with skilled craftsmanship — were necessary.

The No. 11 BWG sheet metal is rolled to hemicylindrical form and the heads and flanges welded. Shells are then sand blasted, cleaned, given a 20-lb air injection and submerged in a water-filled tank to insure that no air leaks exist at gasket and welded joints.

At assembly the containers are spray-painted inside and out. After internal parts are installed and upper and lower sections bolted together, the "cans" are neatly stacked, then shipped by rail and truck to their destination.

Participate in Press Program

U. S. Air Force has announced the seven companies scheduled to receive and operate the 20 heavy and super-heavy forging and extrusion presses it is developing.

Firms are: Wyman-Gordon Co., Aluminum Co. of America, Kaiser Aluminum & Chemical Co., Harvey Machine Co., Reynolds Metals Co., Bohn Aluminum & Brass Co., and Curtiss-Wright Corp.

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Richmond, Va.: Phone 7-4573
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Standard Brass & Mfg. Co.
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Ambassador 2-6700
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CLEVELAND, Ohio
Nottingham Steel Company
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For example, some Kaiser Aluminum distributors have made surveys of the plant facilities of their customers for possible conversion to defense work. This material has been compiled in printed form and is supplied to the purchasing and contract agencies of the Defense Department and the War Production Board.

Others have called the qualifications of their customers to the attention of manufacturers with defense orders . . . have been able to obtain sub-contract work and aluminum supplies under extended D.O.'s for them.

Equally important, Kaiser Aluminum Warehouse Distributors offer you the cost and service advantages shown in the side panel.

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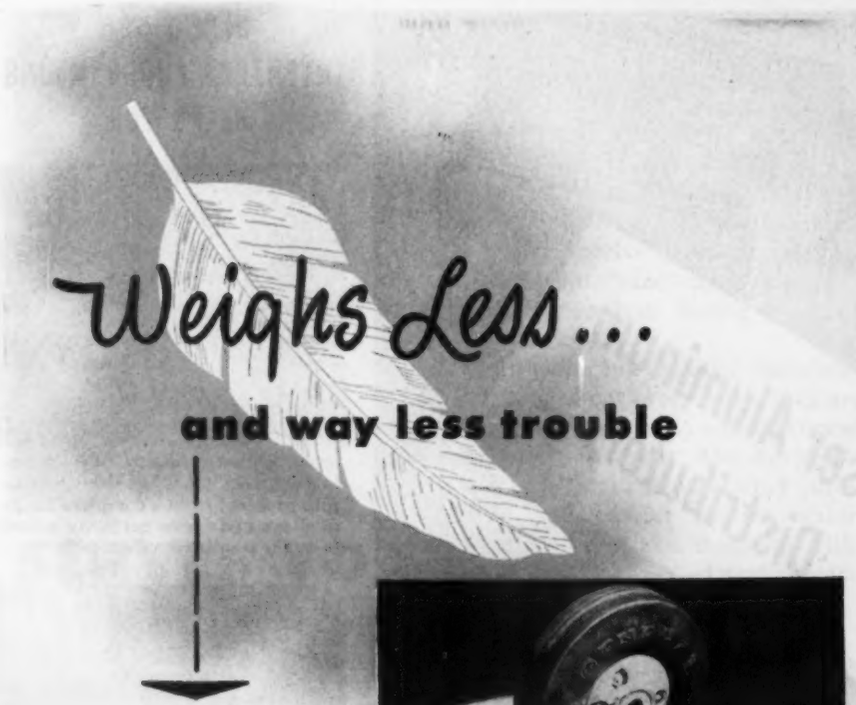
LOWER HANDLING COSTS—Specialization of plant and handling equipment permits machine side deliveries at lower cost than possible in most fabricating plants, cuts stock keeping and accounting costs.

SMALLER SPACE REQUIREMENTS—Space necessary to house your average raw material inventory can be devoted to production. Becomes a source of income rather than an expense.



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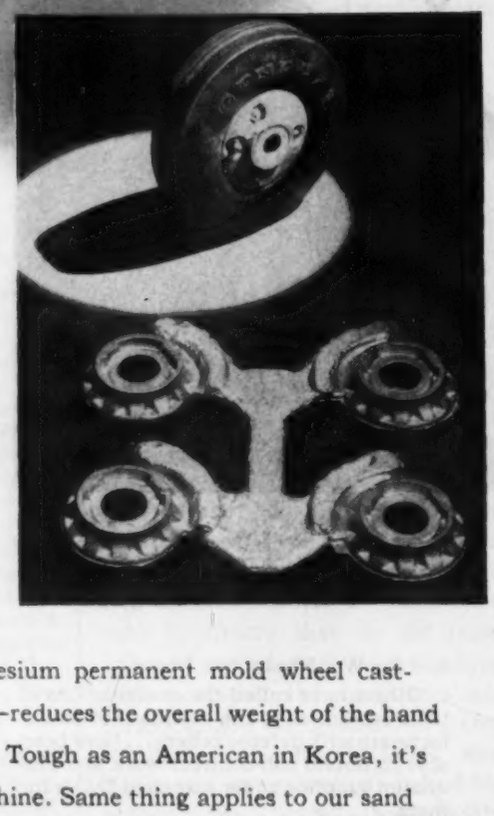

This Well-Cast magnesium permanent mold wheel casting—a ¼ lb. light weight—reduces the overall weight of the hand truck on which it's used. Tough as an American in Korea, it's also a push-over to machine. Same thing applies to our sand castings in either magnesium or aluminum. Want to lose some weight?

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Report on Mining Hazards

Occupational hazards to young workers in *Mining Other Than Coal* is the subject of a recently published Bureau of Labor Standards report. The report, which served as a basis for Hazardous Occupations Order No. 9, prohibits employment of minors under 18 in occupations considered particularly hazardous or detrimental to their health. Copies of the report may be obtained from the Superintendent of Documents, Washington 25, D. C., for 25¢.

Design New Freight Car Truck

New type freight car trucks, developed by Chrysler engineers, are being used by the U. S. Army Transportation Corps to protect railway freight shipments. The new trucks are designed to reduce shock and vibration in transit and will be used on new railroad ammunition cars going into service after the first of the year.

In the Chrysler design, the body of the railway car is suspended on the trucks by U-shaped swing hangers acting as pendulums. The swinging action of the hangers permits the trucks to move sideways to absorb lateral shocks without transmitting these shocks to the car body and its freight load. Vertical shocks are cushioned by standard long travel coil springs.

New Pipe Line Put in Operation

The new $135 million natural gas transmission line connecting Texas Gulf Coast fields with the Chicago area has been placed in operation by the Texas-Illinois Natural Gas Pipeline Co. This is the third long distance pipeline linking the Chicago area with the Southwest. Construction of the pipeline took less than 16 months.

Initial capacity of the new line will be 374,000 cu ft of natural gas daily. This will be added to the present flow of 510 million cu ft of natural gas supplied daily by the present dual lines of Natural Gas Pipeline Co. of America. Ultimately the new pipeline will produce 524 million cu ft per day.

Some Consumer Inventories Nearing Legal Limits

Caused partly by restrictions on production . . . New orders quickly fill soft spots at mill level . . . CMP ticket holders playing musical chairs . . . New mat program . . . Ingot rate up.

Steel officials who have visited Detroit are convinced that demand for cold-rolled sheets is definitely down. Some high auto executives have admitted this to them. But the big question still unanswered is this: To what extent is this caused by government restrictions on civilian production?

Some sheet users are actually concerned over growing cold-rolled inventories—which, in some cases, are reaching allowable inventory limits. With production restrictions, current and planned, there is some chance of inventory limits being passed. It is this situation that has put the whammy on gray market and conversion deals.

Shifting—Hot-rolled sheets are still very tight because of their extensive use in military items. In some applications, consumers are substituting cold-rolled for hot-rolled sheets which they can't get.

This is quite a change from a year or more ago, when cold-rolled sheets were about the tightest product in the steel market. But, even with Controlled Materials Plan tickets, consumers still can't just walk into a mill and place an order for quick delivery of sheets. Demand varies among widths and gages. And soft spots at mill level are rather quickly firmed up with orders soon after they appear.

On Target?—So far, this is apparently about what National Production Authority hoped would happen when it curtailed auto and appliance production and urged diversion of continuous strip mills to more light plate production. Some Detroit sources, including labor, believe they have gone too far, and will cite employment figures to prove it. This is a factor in placing large defense contracts with auto makers, despite pressure in Washington to spread defense orders more widely.

Some first quarter cold-finished bar orders have been cancelled by farm equipment makers. It could not be determined whether these cancellations resulted from production curtailments or rising inventories, since consumers are wary of admitting the latter. But producers say that 10 other users are waiting to pick up every cancellation.

Backtracking — Reports from other sources strengthen the belief that many consumer inventories are gradually being built up to maximum permitted levels. For example, a warehouse was offered excess tonnage from two large users of bars and electric sheets. The offers were worked legitimately—through NPA, back to the producer and reapplied to the warehouse.

An order is now being worked out which would obviate the need for such time-consuming backtracking. It would permit holders of excess steel stocks to sell them to warehouses without going back through NPA and the producer.

Musical Chairs—Although sheet conversion ingots are relatively easy, they bounced quickly from the unrealistic low of $66 a ton recently reported here. Ingots of this type are now priced at about $90 a ton. During the past week THE IRON AGE learned of two small producers who have ingot capacity available.

Greater steel production shows more promise of making CMP run smoothly than alterations in controls. As one source explains it, numerically, about 40 pct of customers who use about 70 pct of the steel are being well taken care of. The remaining 60 pct of steel users who use only 30 pct of steel are as uncertain as ever. This is another way of saying that too many tickets are still being issued, and customers with insecure mill connections are playing musical chairs for their steel—with some being left looking for a seat each quarter.

Mat Program—A new government landing mat program is expected to be getting under way, as bids from fabricators are being invited. The old mat, made of 10-gage hot-rolled steel, will not be suitable for larger and heavier bombers. Present landing mat programs of the old type will be carried through August.

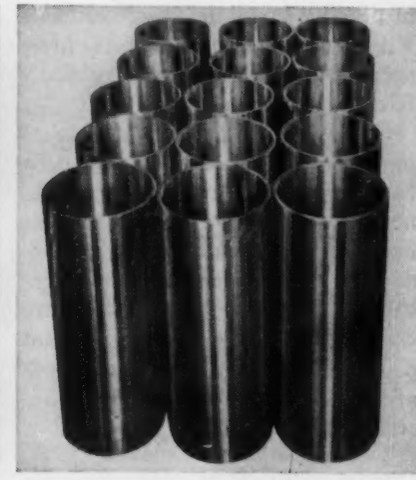
The new mats will be made of 11-gage hot-rolled and will be of greater strength and different construction and design. So far, the program is reported to call for a million sq ft of 11-gage hot-rolled. It is estimated fabricators will need an initial investment of half a million dollars for retooling and equipping.

Ingot Rate Up—Steelmaking operations this week are scheduled at 104 pct of rated capacity, up half a point from the previous week. But labor and scrap trouble threaten to curb the record production pace. Steel people aren't optimistic; they feel a near miracle will be needed to solve each of these problems. Some think labor is the more immediate problem because a strike would make the scrap shortage academic—for a while.

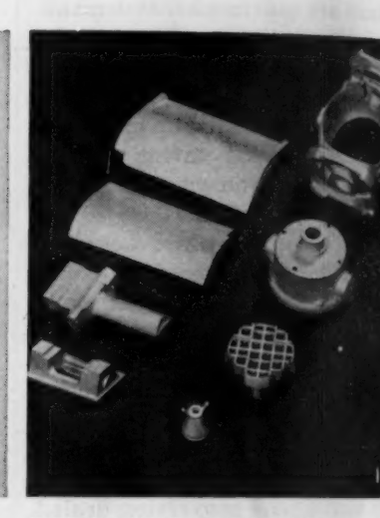
for strong, hard, heat- and corrosion-resisting Castings

—consider MONEL, NICKEL and INCONEL

SAND CASTINGS



CENTRIFUGAL CASTINGS



PRECISION CASTINGS

If you want castings that must show long life—even under severe corrosive, thermal and mechanical conditions—investigate problem-solving Monel, Nickel and Inconel.

These Inco Nickel Alloys resist corrosion by most acids, alkalies and salts; they have the hardness needed to withstand abrasive and erosive attack; they are strong at high temperatures, at low temperatures.

"S" Monel's high hardness and resistance to galling make it a favorite material for all wearing surfaces where erosion is a factor. "H" Monel is used where better ductility is required on mildly abrasive applications.

Inco will supply the castings to your order from our own foundry at Bayonne, N. J. This foundry is maintained as a service to users of Nickel alloys.

Here, your order gets *double* expert attention. Attention by expert foundrymen; attention by foundrymen who are experts in casting high-Nickel alloys.

At present much of Inco's production is being diverted to defense and you may not be able to get immediate delivery. However, our expert foundrymen are always ready to help you with your special casting problems, whether they be sand, centrifugal or precision.

Pass the details along to Inco at the address below. Let us work it out with you to see how economically it can be solved by use of high-Nickel alloys.

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SAE, AISI, NE Steels
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Think of Inco for Castings in durable metals

Market Briefs

closing down—A substantial part of the Homestead Works of U. S. Steel Co. will be dismantled in the next 10 years, according to M. W. Reed, executive vice-president. Clairton Works also has an indefinite future, he said. The company recently demolished No. 2 openhearth shop, and the No. 3 openhearth will also go. There are no plans for replacing these facilities. A blast furnace at the Carrie Works is also scheduled to come down.

more ore—Fourth quarter allocations of molybdenum ores and concentrates, the International Materials Conference says, have been increased by 170 metric tons, with the U. S. gaining 116 tons and the United Kingdom 17. Other countries will benefit from the larger allocation in the following amounts: France, 7 tons; Western Germany, 5 tons; Sweden, 3 tons; Japan, 1 ton; and Italy, 1 ton. The remaining quantity—20 tons—will be set aside for emergency use and to meet requirements of additional interested countries.

good pay—Iron and steel industry employment and payrolls are at record high levels, according to American Iron & Steel Institute. Total payroll for the first 9 months of 1951 was 23 pct more than for the comparable period last year. Total for this year is estimated at nearly $2.9 billion, $472 million over 1950. Average hourly payments to wage earners in the industry rose to a new high of $1.974 in September. Industry employment reached a new record in August of 679,000.

TV short—Shortages of basic materials and critical parts have caught up with television and radio set manufacturers, threatening first half and perhaps all of 1952 production. Manufacturers inventories are at a low point, with most unsold sets in the hands of distributors, the industry's advisory committee has reported to National Production Authority. So are inventories of basic materials.

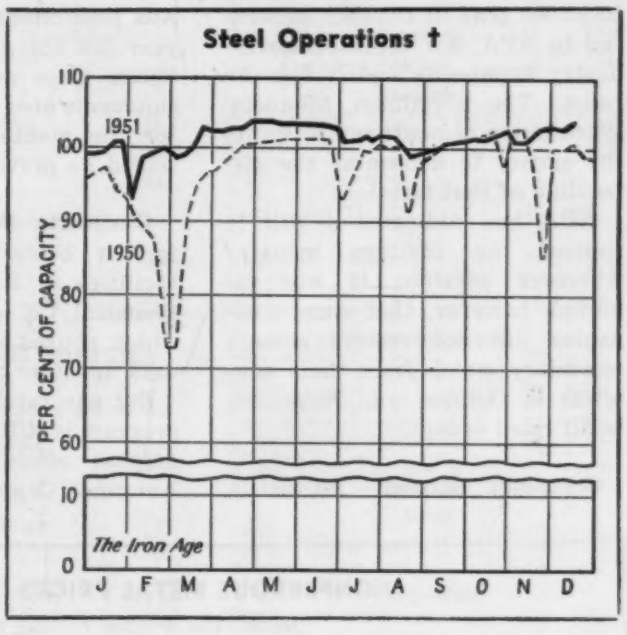
with pay—Wage Stabilization Board says employers may designate Dec. 24 and 31 as additional days off with pay without regard to past practice, and without offset against the amount available for future pay rises under WSB Reg. 6.

power plants—Electric utility power plants consumed 9,583,491 tons of coal and produced 32,440,940,000 kw hr of power in October, according to the Federal Power Commission. The production figure is the highest on record.

production pool—Illinois Manufacturers Defense Pool, Inc., received approval last week from the United States Attorney General and Defense Production Administrator to operate as a defense production pool immune from anti-trust laws. Offices are located at 209 S. LaSalle St., Chicago.

rail rates—Higher freight rate petitions by railroads will be heard by Interstate Commerce Commission beginning Jan. 14. Roads want the full 15 pct increase requested earlier, to replace the 9 pct hike for eastern traffic and 6 pct elsewhere that ICC granted in August. Reason given is that lower increases will not cover heightened costs.

device—Resourceful steel consumers seem never to run out of new ideas on how to get steel. An interesting one detected last week works like this: Customer asks several steel suppliers to send him a letter saying his steel order has been turned down. Thus armed, he descends on Washington, prepared to plead his case to the hilt.



District Operating Rates—Per Cent of Capacity †

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Dec. 2	101.0	105.5	104.0*	101.5	103.0	104.0	99.0*	106.0	105.0*	104.0	98.5	93.5	114.0	103.5
Dec. 9	101.0	107.0	103.0	101.5	104.0	104.0	103.0	106.0	105.0	104.0	98.5	93.5	103.0	104.0

† Beginning Jan. 1, 1951, operations are based on annual capacity of 104,229,650 net tons.
* Revised.

NPA May Allocate Aluminum Scrap

Some foundries not able to fill rated orders because of shortage . . . NPA to channel military aluminum scrap direct to proper users . . . Anaconda may back out—*By R. L. Hatschek.*

National Production Authority may allocate aluminum scrap in order to key distribution to the needs of the rearmament program. Though this is still in the "consideration" stage, one plan is already under way to assist in eliminating the supply dislocations felt by the secondary smelters and foundries—a plan to direct military scrap straight to smelters, reclaimers, producers and fabricators.

The current distribution system —metal to the highest bidder— makes it difficult to ascertain the end-use of the material.

Ingot Shipments Up—Shipments of secondary ingots by smelters rose from 8858 tons in September to 11,000 tons in October, according to NPA, but the castings industry apparently hadn't felt the boost. The aluminum founders' Washington committee now wants the agency to determine the disposition of that metal.

NPA has indicated a will to support the castings industr/ wherever possible. It was reported, however, that some companies did not receive enough secondary metal from their suppliers in October and November to fill rated orders.

Scrappies Blamed — As usual, scrap dealers were held responsible, at least in part, for the reduced supplies. It was claimed that some dealers were withholding material in anticipation of a price increase or for year-end tax juggling. Office of Price Stabilization had already been urged to issue a strongly-worded statement that these prices would not be allowed to increase, a move which it has not yet taken.

Output Higher — October production of 72,647 tons of primary aluminum definitely indicates recovery from the power shortage, being very close to July and August totals. This brings the 10-month total to 692,180 tons and further confirms previous IRON AGE predictions of an 840,000-ton year for the aluminum industry. Sheet, plate and rough castings shipments also showed an increase for the month while foil maintained its previous level.

Chalmette Pours—This output is now being bolstered by new facilities of Kaiser Aluminum & Chemical Co. at Chalmette, La., which poured its first metal two days ago (see p. 88).

But one facet of the expansion program is still very unclear. High defense officials now fear that Anaconda Copper Mining Co. may drop its plans for going into the aluminum industry. Anaconda would have good reason, too, if it could not get a firm long-term power arrangement with Dept. of Interior. President Truman may lift the load of responsibility from Manly Fleischmann's shoulders.

November Zinc—Slab zinc production in November totaled 79,346 tons, a drop less than the 79,432 tons for the previous month, according to American Zinc Institute figures. Total output for the year is 850,055 tons so far and expected December production should bring this to about 929,000 tons. This almost matches 1942 production and is about 42,000 tons less than the all-time record produced in 1943.

Tin Climax Nears—The tin situation is approaching nearer and nearer to the point where something must pop. Production of Grade A tin at the Texas City smelter was only 1806 tons in November, the lowest in 8 years and one of the lowest points ever hit. The pro and con battle of words on the government's handling of the situation is ranging all over but little is being done about it.

Singapore prices dropped to a New York equivalent of about $1.13 and then rose slightly to about $1.15¼ c.i.f. New York at the end of the week. This is very close to Reconstruction Finance Corp.'s "fair price" and more and more pressure is being put on by tin consumers—particularly can makers—for the government to resume buying in world markets.

Action Necessary — Tin stocks are tumbling lower and lower while the United States, world's largest tin consumer, faces an increasingly acute shortage of the metal. And world production exceeds demand! If some agreement is not soon reached, the U. S. will be in a bad bargaining position.

NONFERROUS METAL PRICES

	Dec. 5	Dec. 6	Dec. 7	Dec. 8	Dec. 10	Dec. 11
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.03	$1.03	$1.03	....	$1.03	$1.03*
Zinc, East St. Louis	19.50	19.50	19.50	19.50	19.50	19.50
Lead, St. Louis	18.80	18.80	18.80	18.80	18.80	18.80

*Tentative
Note: Quotations are going prices.

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.3¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate ¼ in. and heavier: 2S, 3S-F, 28.3¢ 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 28.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 39.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 29.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 37¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63-S-T-5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.42; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.24 x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. Coiled Sheet: 0.019 in. x 28 in., 29.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in., 66¢; ¼ in., 67¢; B & S Gage 10, 68¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, $1.05; 22, $1.27; 24, $1.67. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb, ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; ¼ in. to 5/16, $1.40; 5/16 to ¾, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1¼ in., 10,000 lb; 1¼ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	41.68	....	41.28
Copper, h-r	....	37.53	....
Copper, drawn	....	38.78	....
Low brass	39.67	39.36	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	43.20	37.26	38.52
Leaded copper	....	41.58	....
Com'l bronze	41.13	40.82	....
Mang. bronze	46.92	40.81	42.37
Phos. bronze	61.07	61.32	....
Muntz metal	41.12	36.74	37.99
Ni silver, 10 pct	49.82	52.04	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	1800
Antimony, American, Laredo, Tex.	50.00
Beryllium copper, 3.75-4.25% Be	1.56
Beryllium aluminum 5% be, Dollars per lb contained Be	$69.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.55
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$200
Lead, St. Louis	18.80
Lead, New York	19.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	24.50
Magnesium, sticks, 100 to 500 lb	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$215-$218
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	88.00
Tin, New York	$1.03
Titanium, sponge	$5.00
Zinc, East St. Louis	19.50
Zinc, New York	20.20
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	32.25
No. 315	30.25
88-10-2 ingot	
No. 210	40.00
No. 215	38.50
No. 245	33.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	30.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	21.2
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.00
Grade 2—92-95%	17.75
Grade 3—90-92%	17.25
Grade 4—85-90%	16.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.84
Electrodeposited	33¾
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34½
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz. f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz.	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ⅛¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow brass	19½	17¾
Red brass	20½	19¾
Comm. bronze	20½	19¾
Mang. bronze	18½	17¾
Brass rod ends	18¾	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75
Aluminum	
Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying price, f.o.b New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18¾—19¼
No. 2 heavy copper and wire	17¼—17¾
Light copper	16 —16½
New type shell cuttings	16 —16½
Auto radiators (unsweated)	14¼—14¾
No. 1 composition	18 —18½
No. 1 composition turnings	17¾—18
Unlined red car boxes	16¾—17¼
Cocks and faucets	15½—16
Mixed heavy yellow brass	12 —12½
Old rolled brass	15 —15½
Brass pipe	16 —16½
New soft brass clippings	16 —16½
Brass rod ends	15½—16
No. 1 brass rod turnings	15 —15½

Aluminum

Alum. pistons and struts	6½— 7½
Aluminum crankcases	7½— 8
2S aluminum clippings	10½
Old sheet and utensils	7½— 8
Borings and turnings	5 — 6
Misc. cast aluminum	7½— 8
Dural clips (24S)	10 —11

Zinc

New zinc clippings	13¼—13½
Old zinc	10 —10¼
Zinc routings	6¾— 7
Old die cast scrap	6¾— 7

Nickel and Monel

Pure nickel clippings	35 —36
Clean nickel turnings	35 —36
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	20 —21
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13

Lead

Soft scrap, lead	15¾—16
Battery plates (dry)	10½—11
Batteries, acid free	7 — 7¼

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	85 —90
No. 1 pewter	60 —65
No. 1 auto babbitt	48 —50
Mixed common babbitt	16¼—16½
Solder joints	21 —22
Siphon tops	48 —50
Small foundry type	21 —22
Monotype	18½—19
Lino. and stereotype	17½—18
Electrotype	16 —16½
Hand picked type shells	10 —11
Lino. and stereo. dross	8¾— 9
Electro. dross	7½— 8

OPS, NPA Reach Deeper into Scrap

OPS shows signs of more extensive investigations . . . Issues graveyard turnover order . . . NPA men track down rumor of withheld inventory . . . Southern yards to work extra Sunday.

Although the threat made by NPA's Manly Fleischmann to requisition scrap from industry is regarded as impossible to fulfill, other arms of Washington were reaching out into scrap trading.

Office of Price Stabilization was nosing around a few districts. That agency was also cracking down on one scrap dealer for "the intent to upgrade" and was studying another violation.

OPS also issued an inventory control order for auto graveyards which amounts to a requisition on stocks. Autowreckers must now have a periodic turnover of inventory. More intensive dealer preparation work of jalopies is anticipated after initial confusion is dispelled.

National Production Authority people were in Detroit, tracking down a rumor that dealers were withholding scrap so that they could keep in a lower income tax bracket. So far, it does not appear that NPA will be able to pin anything on anyone. If they do unearth some withheld scrap it probably will be insignificant and the rare exception to the rule.

Edwin Barringer, ISIS executive vice-president, has asked NPA for names of dealers holding back scrap after the charge was made. But NPA was vague. This junket to Detroit may be an attempt to prove their point.

In one section at least (Pittsburgh) the scrap shortage has intensified into crisis—but despite the cries of calamity some scrap men are counting on trouble blowing over without any *serious* loss of openhearth production. They take the broad view that you can't have everything and even if a little production is lost it won't make any dent on overall output.

Early this week, the Southern chapter of ISIS met in Greensboro, N. C., and voted to work their yards one Sunday this month to get out extra tonnages of scrap. Normal workweek is 5½ days. It means absorbing overtime.

Pittsburgh—A shortage of scrap has caused a loss of steel production at Ohio River Steel Corp., Toronto, Ohia. Low inventory forced the company to take off an openhearth furnace 10 days ahead if its scheduled shutdown for rebuilding. Repairs will be completed the week of Dec. 22. Since this low point the company has built its stockpile to 5 to 6 days' supply. The scrap picture in the district continues gloomy.

Chicago—NPA officials last week tried to sell scrap men here removal of street car lines. Chicago Transit Authority has offered the rails free if slots left by their removal were filled with cement to prepare for resurfacing. Cost of the rail consumers may top $70 a ton and OPS would have to waive ceilings. Inventory at plants of the leading mill here was slightly increased at weeks' end, reaching 7.5 days average supply.

Philadelphia—Brokers report that the auto graveyard scrap drive has bogged down with a delay in inventory checks. Smaller mills in the district now are at their lowest point in inventory ever reached and the situation could get worse quickly. Snow and ice could delay needed truck shipments. Some feel that openhearth shutdowns are inevitable.

New York—Scrap flow is traditionally slow. December showed no change. Demand was at a high pitch, especially from some large Pittsburgh mills still eating into inventory. OPS men are signalling that they may invade this area. Scrap men here want to see flagrant violators of grading codes caught but hope OPS will be realistic on enforcement so that supply will not be endangered.

Detroit — Government men have been here this past week checking if scrap shipments are being held up for tax purposes or for other reasons. There are no present indications that scrap is piling up in quantity in local yards. Production scrap has been cut as much as 40 pct in some cases. While the scrap drive is getting some results receipts fall far short of making up the industrial scrap deficit.

Cleveland—Some mills here report drop in receipts while others claim little change. One broker estimates production scrap is down 40 pct while electric grade shipments have taken a turn for the better. It has been suggested mills be permitted to purchase cupola cast to help relieve need for No. 1. Dealers feel this would help them get rid of the cast which foundries are not seeking.

St. Louis—The scrap supply here seems to be worse this week. Mills continue to dig into their inventories. All are getting allocations but allocations are being issued for scrap dealers don't have. Railroad lists are light, as dismantling work slows down.

Birmingham — Cast scrap was a little more plentiful this week, but heavy melting and electric furnace grades arriving on allocation were just enough to keep mills operating. Scrap drives in several counties are beginning to show results. But because of allocations very little "free" scrap is in sight.

Cincinnati—All dealers in this area still supplying scrap to Newport, Ky., and Middletown, Ohio. Newport steel receiving allocated scrap from many southern states but still functions on day-to-day basis. Armco at Middletown is in similar situation although receipts of industrial production scrap are definitely off as a result of curtailed production in local plants.

Boston—Scrap continues to remain in heavy demand here with unclean motor blocks, the one weak spot a few weeks ago, now selling at ceiling prices. The scarcity of good materials is showing up more than ever.

Buffalo—Mills here have about a 2-week supply and outside allocations are expected. Fresh receipts are low. More than 75 pct of current pig iron production is going to openhearths.

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LURIA BROTHERS AND COMPANY, INC.

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Pacific Gas & Elec. Co., Bldg.

SEATTLE, WASH.
Smith Tower

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Iron and Steel

SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS in CPR 5 and amendments. Shipping point and delivered prices calculated as shown below.)

Switching Charge (Dollars per gross ton) →		$0.59	.75	.63	.65	.75	.61	.75	.75	.51	.63	.51	.75	.70	.76	.83	.65	.26	1.34	.76	.60	.20	.20	.62	.47	.51	.51	.51	.95	.50	.78	.50	.43	.51	.33	.67	.66	.83	.83	.83
Basing Points →		Pittsburgh	Johnstown	Brackenridge	Butler	Midland	Monessen	Sharon	Youngstown	Canton	Steubenville	Warren	Weirton	Cleveland	Buffalo	Cincinnati	Middletown	Chicago	Claymont	Coatesville	Conshohocken	Harrisburg	Phoenixville	Sparrows Pt.	Bethlehem	Ashland, Ky.	Kokomo, Ind.	Portsmouth, O.	St. Louis	Detroit	Duluth	Kansas City	Birmingham	Alabama City	Atlanta	Minneapolis	Houston	Los Angeles	Pittsburg, Cal.	Portland, Ore.	Seattle
GRADES	OPS No.																																							
No. 1 bundles	1		$44.00						$44.00					$43.00				$42.50						$42.00				$41.00	$41.15	$40.00	$39.50	$39.00			$38.00	$37.00		$35.00		
No. 1 busheling	2		44.00						44.00					43.00				42.50						42.00				41.00	41.15	40.00	39.50	39.00			38.00	37.00		35.00		
No. 1 heavy melting	3		43.00						43.00					42.00				41.50						41.00				40.00	40.15	39.00	38.50	38.00			37.00	36.00		34.00		
No. 2 heavy melting	4		43.00						43.00					42.00				41.50						41.00				40.00	40.15	39.00	38.50	38.00			37.00	36.00		34.00		
No. 2 bundles	5		43.00						43.00					42.00				41.50						41.00				40.00	40.15	39.00	38.50	38.00			37.00	36.00		34.00		
Machine shop turnings	6		34.00						34.00					33.00				32.50						32.00				31.00	31.15	30.00	29.50	29.00			28.00	27.00		25.00		
Mixed borings and turnings	7		38.00						38.00					37.00				36.50						36.00				35.00	35.15	34.00	33.50	33.00			32.00	31.00		29.00		
Shoveling turnings	8		38.00						38.00					37.00				36.50						36.00				35.00	35.15	34.00	33.50	33.00			32.00	31.00		29.00		
Cast iron borings	10		38.00						38.00					37.00				36.50						36.00				35.00	35.15	34.00	33.50	33.00			32.00	31.00		29.00		
No. 1 chemical borings	26		41.00						41.00					40.00				39.50						39.00				38.00	38.15	37.00	36.50	36.00			35.00	34.00		32.00		
Forge crops	11		51.50						51.50					50.50				50.00						49.50				48.50	48.65	47.50	47.00	46.50			45.50	44.50		42.50		
Bar crops and plate	12		49.00						49.00					48.00				47.50						47.00				46.00	46.15	45.00	44.50	44.00			43.00	42.00		40.00		
Punchings and plate	14		46.50						46.50					45.50				45.00						44 50				43.50	43.65	42.50	42.00	41.50			40.50	39.50		37.50		
Electric furnace bundles	15		46.00						46.00					45.00				44.50						44.00				43.00	43.15	42.00	41.50	41.00			40.00	39.00		37.00		
Cut struct., plate, 3 ft and less	16		47.00						47.00					46.00				45.50						45.00				44.00	44.15	43.00	42.50	42.00			41.00	40.00		38.00		
Cut struct., plate, 2 ft and less	17		49.00						49.00					48.00				47.50						47.00				46.00	46.15	45.00	44.50	44.00			43.00	42.00		40.00		
Cut struct., plate, 1 ft and less	18		50.00						50.00					49.00				48.50						48.00				47.00	47.15	46.00	45.50	45.00			44.00	43.00		41.00		
Foundry steel, 2 ft and less	20		44.00						44.00					43.00				42.50						42.00				41.00	41.15	40.00	39.50	39.00			38.00	37.00		35.00		
Foundry steel, 1 ft and less	21		46.00						46.00					45.00				44.50						44.00				43.00	43.15	42.00	41.50	41.00			40.00	39.00		37.00		
Heavy trimmings	24		43.00						43.00					42.00				41.50						41.00				40.00	40.15	39.00	38.50	38.00			37.00	36.00		34.00		
Hard steel, 2 ft and less	30		49.00						49.00					48.00				47.50						47.00				45.00	46.15	45.00	44.50	44.00			43.00	42.00		40.00		
No. 1 RR heavy melting	RR 1		46.00						46.00					45.00				44.50						44.00				43.00	43.15	42.00	41.50	41.00			40.00	39.00		37.00		
Scrap rails, random lengths	RR 14		48.00						48.00					47.00				46.50						46 00				45.00	45.15	44.00	43.50	43.00			42.00	41.00		39.00		
Scrap rails, 3 ft and less	RR 16		51.00						51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	46.00			45.00	44.00		42.00		
Scrap rails, 2 ft and less	RR 17		52.00						52.00					51.00				50.50						50.00				49.00	49.15	48.00	47.50	47.00			46.00	45.00		43.00		
Scrap rails, 18 in. and less	RR 18		54.00						54.00					53.00				52.50						52.00				51.00	51.15	50.00	49.50	49.00			48.00	47.00		45.00		
Rerolling rails	RR 15		53.00						53.00					52.00				51.50						51.00				50.00	50.15	49.00	48.50	48.00			47.00	46.00		44.00		
Uncut tires	RR 20		48.00						48.00					47.00				46.50						46.00				45.00	45.15	44.00	43.50	43.00			42.00	41.00		39.00		
Cut tires	RR 21		51.00						51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	46.00			45.00	44.00		42.00		
Cut bolsters and side frames	RR 23		49.00						49.00					48.00				47.50						47.00				46.00	46.15	45.00	44.50	44.00			43.00	42.00		40.00		
RR specialties	RR 24, 28, 29		51.00						51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	46.00			45.00	44.00		42.00		
Solid steel axles	RR 25		58.00						58.00					57.00				56.50						56 00				55.00	55.15	54.00	53.50	53.00			52.00	51.00		49.00		
No. 3 steel wheels	RR 27		51.00						51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	46.00			45.00	44.00		42.00		
Unassorted	RR 35		40.00						40.00					39.00				38.50						38.00				37.00	37.15	36.00	35.50	35.00			34.00	33.00		31.00		

Cast Scrap

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron carwheels	9	47.00
Malleable	10	55.00
Drop broken mach'y cast	11	52.00

Ceiling price of clean cast iron foundry runout or prepared cupola drops is 75 pct of corresponding grade.

SWITCHING DISTRICTS—These basing points include the indicated switching districts: Pittsburgh: Bessemer, Homestead, Duquesne, Munhall. Cincinnati: Newport. St. Louis: Granite City, East St. Louis, Madison, and Federal, Ill. San Francisco: South San Francisco, Niles, Oakland. Claymont: Chester. Chicago: Gary.

SHIPPING POINT PRICES (Except RR scrap)—for shipping points within basing points, the ceiling shipping point price is the basing point price, less switching charge. The ceiling for shipping points outside basing points is the basing point price yielding the highest shipping point price, less the lowest established freight charge. Dock charge, where applicable, is $1.25 per gross ton except: Memphis, 95¢; Great Lakes ports, $1.50, and New England ports, $1.75. Maximum shipping point price on No. 1 bundles (prime grade) in New York City is $36.99 per gross ton with set differentials for other grades. Hudson and Bergen County, N. J., shipping point prices are computed from Bethlehem basing point. All New Jersey computations use all-rail transport. Cast scrap shipping point prices are given in table.

DELIVERED PRICES (RR scrap) — Ceiling on-line price of a RR operating in a basing point is the top in the highest priced basing point in which the RR operates. For off-line prices, RR's not operating in basing point non-operating RR's, and RR scrap sold by someone other than a RR see text of order, THE IRON AGE, Feb. 8, 1951, p. 137-C and amend. 4, CPR 5.

DELIVERED PRICES (Except RR scrap)—Ceiling is the shipping point price plus actual freight charge, tax included. Dock charges, where applicable, are as above.

UNPREPARED SCRAP—Under Amend. 5 to CPR 5 ceiling prices are established for certain unprepared grades. Unprepared steel scrap for compression into No. 1 bundles calls for a $6 differential (or deduction) from the base (No. 1 bundles). Unprepared steel scrap for No. 2 bundles, $9 from base. Unprepared steel scrap other than material suitable for hydraulic compression, $8 from base. Sec. 7 (a) (2) (Railroad grades) is amended to include: Unprepared steel scrap other than material suitable for hydraulic compression, $8 from base.

COMMISSIONS — Brokers are permitted a maximum of $1 per gross ton commission which must be separate on the bill.

ALLOY PREMIUMS—These alloy extras are permitted: **Nickel:** $1.25 may be added to price of No. 1 heavy for each 0.25 pct nickel between 1 and 5.25 pct. **Molybdenum:** $2 may be added to price of No. 1 heavy for molybdenum over 0.15 pct, $3 for content over 0.65 pct. **Manganese:** $4 may be added to price of No. 1 heavy or No. 1 RR heavy for content over 10 pct if scrap is in sizes over 8 x 12 x 24 in., $14 if less than 8 x 12 x 24 in. Manganese premium applicable only if sold for electric furnace use or on NPA allocation. **Silicon:** electric furnace and foundry grade adjustments are not applicable if silicon content is between 0.5 and 1.75 pct. **Chromium:** $1 may be added if scrap conforms to SAE 52100 analysis. **Multiple Alloys:** if scrap contains two premium alloy elements, total premium may not exceed ceiling premium for any one contained alloy.

RESTRICTIONS ON USE—Ceiling prices on some scrap items may fluctuate with use by consumers. If some scrap is purchased for its established specialized use, the ceiling price set in the order stands. But if some special grades are purchased for other uses, the ceiling price charge shall be the price of the scrap grade being substituted. Restrictions on use are placed on the following grades: Chemical borings, wrought iron and rerolling rails, cupola cast, billet, bloom, and forge crops, Nos. 1 and 2 chemical borings. Ceiling prices on billet, bloom and forge crops, alloy-free turnings, and heavy turnings may be charged only when shipped directly from industrial producer.

See Amend. 5 to CPR for setting of single price on No. 1 Heavy, No. 2, and No. 1 bundles. No. 1 bundles are made prime grade from which to add or subtract differentials. Amendment also puts dealer to dealer sales under ceilings, permitting a $1 resale margin, and trucking charges may be added only on shipments of prepared scrap.

CEILING INTRANSIT PREPARATION CHARGES (Dollars per gross ton)

No. 1 heavy; No. 2 heavy; No. 1RR heavy; No. 2 RR heavy; No. 1 busheling; No. 2 bundles; electric furnace bundles	$3.00
No. 1 bundles; briquetted turnings or cast iron borings; No. 1 RR sheet scrap	6.00
Crushing machine shop turnings	9.00
Bar crops and plate, cast steel, punchings and plate, cut structural and plate, 3 ft and under, foundry steel, 2 ft and under, wrought iron	10.00
Structural, plate scrap, 2 ft and less, foundry steel 1 ft and less	11.00
Structural and plate scrap, 1 ft and less	12.00
Rails, 3 ft & less; cut tires; cut bolsters & side frames	4.00
Rails, 2 ft & less	5.00
Rails, 18 in. & less	7.00

Hamilton, Ontario

(Consumers buying prices, del'd gross ton)

Hvy. melting steel	$35.00
No. 1 bundles	35.00
No. 2 bundles	34.50
Mechanical bundles	32.00
Mixed, steel scrap	31.00
Rails, remelting	35.00
Rails, rerolling	38.00
Bushelings	30.00
Bushelings, prepared new factory	33.00
Bushelings, unprepared new factory	25.00
Short steel turnings	32.00
Mixed borings, turnings	32.00
Cast scrap	55.00

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Dec. 11, 1951	Dec. 4, 1951	Nov. 13, 1951	Dec. 12, 1950
Hot-rolled sheets	3.50	3.60	3.60	3.60
Cold-rolled sheets	4.35	4.35	4.35	4.35
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.80
Hot-rolled strip	3.50	3.50	3.50	3.50
Cold-rolled strip	4.75	4.75	4.75	4.75
Plate	3.70	3.70	3.70	3.70
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	36.75	36.75	36.75	36.50
Tin and Ternplate: (dollars per base box)				
Tinplate (1.50 lb.) cokes.	$8.70	$8.70	$8.70	$7.50
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	6.60
Special coated mfg. ternes	7.50	7.50	7.50	6.35
Bars and Shapes: (cents per pound)				
Merchant bars	3.70	3.70	3.70	3.70
Cold finished bars	4.55	4.55	4.55	4.55
Alloy bars	4.30	4.30	4.30	4.30
Structural shapes	3.65	3.65	3.65	3.65
Stainless bars (No. 302)	31.50	31.50	31.50	31.25
Wrought iron bars	9.50	9.50	9.50	9.50
Wire (cents per pound)				
Bright wire	4.85	4.85	4.85	4.85
Rails: (dollars per 100 lb)				
Heavy rails	$3.60	$3.60	$3.60	$3.60
Light rails	4.00	4.00	4.00	4.00
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$56.00	$56.00	$56.00	$56.00
Slabs, rerolling	56.00	56.00	56.00	56.00
Forging billets	66.00	66.00	66.00	66.00
Alloy blooms, billets, slabs	70.00	70.00	70.00	70.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	4.10	4.10	4.10	4.10
Skelp	3.35	3.35	3.35	3.35

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Pig Iron: (per gross ton)	Dec. 11, 1951	Dec. 4, 1951	Nov. 13, 1951	Dec. 12, 1950
No. 2 foundry, del'd Phila.	$57.97	$57.97	$57.97	$57.77
No. 2, Valley furnace	52.50	52.50	52.50	52.50
No. 2, Southern Cin'ti	55.58	55.58	55.58	55.58
No. 2, Birmingham	48.88	48.88	48.88	48.88
No. 2, foundry, Chicago†	52.50	52.50	52.50	52.50
Basic del'd Philadelphia	57.09	57.09	57.09	56.92
Basic, Valley furnace	52.00	52.00	52.00	52.00
Malleable, Chicago†	52.50	52.50	52.50	52.50
Malleable, Valley	52.50	52.50	52.50	52.50
Charcoal, Chicago	70.56	70.56	70.56	70.56
Ferromanganese‡	186.25	186.25	186.25	181.20

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$43.00*	$43.00*	$43.00*	$46.25
No. 1 steel, Phila. area	41.50*	41.50*	41.50*	44.50
No. 1 steel, Chicago	41.50*	41.50*	41.50*	44.50
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	43.13
Low phos. Young'n	46.50*	46.50*	46.50*	48.63
No. 1 cast, Pittsburgh	49.00†	49.00†	49.00†	66.75
No. 1 cast, Philadelphia	49.00†	49.00†	49.00†	53.50
No. 1 cast, Chicago	49.00†	49.00†	49.00†	65.00

*Basing Pt. †Shipping Pt.
Not including broker's fee after Feb. 7, 1951.

Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.25
Foundry coke, prompt	17.75	17.75	17.75	16.75

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	24.50
Copper, Lake, Conn.	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.03†	$1.03	$1.03	$1.395
Zinc, East St. Louis	19.50	19.50	19.50	17.50
Lead, St. Louis	18.80	18.80	18.80	16.80
Aluminum, virgin	19.00	19.00	19.00	19.00
Nickel, electrolytic	59.58	59.58	59.58	51.22
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex.	50.00	50.00	42.00	32.00

†Tentative.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)

Finished Steel Base Price

Dec. 11, 1951	4.131¢ per lb.
One week ago	4.131¢ per lb.
One month ago	4.131¢ per lb.
One year ago	4.131¢ per lb.

	High		Low	
1951	4.131¢	Jan. 2	4.131¢	Jan. 2
1950	4.131¢	Dec. 1	3.837¢	Jan. 3
1949	3.837¢	Dec. 27	3.3705¢	May 3
1948	3.721¢	July 27	3.193¢	Jan. 1
1947	3.193¢	July 29	2.848¢	Jan. 1
1946	2.848¢	Dec. 31	2.464¢	Jan. 1
1945	2.464¢	May 29	2.396¢	Jan. 1
1944	2.396¢		2.396¢	
1943	2.396¢		2.396¢	
1942	2.396¢		2.396¢	
1941	2.396¢		2.396¢	
1940	2.30467¢	Jan. 2	2.24107¢	Apr. 16
1939	2.35367¢	Jan. 3	2.26689¢	May 16
1938	2.58414¢	Jan. 4	2.27207¢	Oct. 18
1937	2.58414¢	Mar. 9	2.32263¢	Jan. 4
1936	2.32263¢	Dec. 28	2.05200¢	Mar. 10
1932	1.89196¢	July 5	1.83910¢	Mar. 1
1929	2.31773¢	May 28	2.26498¢	Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Pig Iron

Dec. 11, 1951	$52.72 per gross ton
One week ago	52.72 per gross ton
One month ago	52.72 per gross ton
One year ago	52.69 per gross ton

	High		Low	
1951	$52.72	Oct. 9	$52.69	Jan. 2
1950	52.69	Dec. 12	45.88	Jan. 3
1949	46.87	Jan. 18	45.88	Sept. 6
1948	46.91	Oct. 12	39.58	Jan. 6
1947	37.98	Dec. 30	30.14	Jan. 7
1946	30.14	Dec. 10	25.37	Jan. 1
1945	25.37	Oct. 23	23.61	Jan. 2
1944	$23.61		$23.61	
1943	23.61		23.61	
1942	23.61		23.61	
1941	$23.61	Mar. 20	$23.45	Jan. 2
1940	23.45	Dec. 23	22.61	Jan. 2
1939	22.61	Sept. 19	20.61	Sept. 12
1938	23.25	June 21	19.61	July 6
1937	32.25	Mar. 9	20.25	Feb. 16
1936	19.74	Nov. 24	18.73	Aug. 11
1932	14.81	Jan. 5	13.56	Dec. 6
1929	18.71	May 14	18.21	Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel

Dec. 11, 1951	$42.00 per gross ton
One week ago	42.00 per gross ton
One month ago	42.00 per gross ton
One year ago	45.08 per gross ton

	High		Low	
1951	$47.75	Jan. 30	$42.00	Oct. 23
1950	45.13	Dec. 19	26.25	Jan. 3
1949	43.00	Jan. 4	19.33	June 28
1948	43.16	July 27	39.75	Mar. 9
1947	42.58	Oct. 28	29.50	May 20
1946	31.17	Dec. 24	19.17	Jan. 1
1945	19.17	Jan. 2	18.92	May 22
1944	19.17	Jan. 11	15.76	Oct. 24
1943	$19.17		$19.17	
1942	19.17		19.17	
1941	$22.00	Jan. 7	$19.17	Apr. 10
1940	21.83	Dec. 30	16.04	Apr. 9
1939	22.50	Oct. 3	14.08	May 16
1938	15.00	Nov. 22	11.00	June 7
1937	21.92	Mar. 30	12.67	June 9
1936	17.75	Dec. 21	12.67	June 8
1932	8.50	Jan. 12	6.43	July 5
1929	17.58	Jan. 29	14.08	Dec. 8

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$52.00[1]													
Alloy, net ton	$54.00[1,17]													$54.00[1]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$56.00[1,5]	$56.00[1]	$56.00[1]						$56.00[3]		$56.00[3]			
Carbon forging billets, net ton	$66.00[1,5]	$66.00[1,4]	$66.00[1]	$66.00[4]	$66.00[4]				$66.00[3,4]	$73.00[26]	$66.00[3]			$69.00[21]
Alloy, net ton	$70.00[1,17,6]	$70.00[1,4]	$70.00[1,5]		$70.00[4]			$70.00[3]	$70.00[3,4]	$77.00[26]	$70.00[3]			$73.00[21]
PIPE SKELP	3.35[1] 3.45[5]						3.35[1,4]							
WIRE RODS	4.10[2] 4.30[18]	4.10[3,4,33]	4.10[6]	4.10[2]			4.10[6]		4.10[35]		4.10[3]	4.20[3]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.60[1,5,9,15] 3.75[28]	3.60[8,23]	3.60[1,6,9]	3.60[4,5]		3.60[7]	3.60[1,4,6] 4.00[13]		3.60[3]	4.00[26]		3.60[3]	4.30[22]	3.80[13] 4.40[47]
Cold-rolled	4.35[1,5,9,15,7]		4.35[1,6,8]	4.35[4,5]		4.35[7]	4.35[4,6]		4.35[3]			4.35[3]	5.05[22]	4.55[13]
Galvanized (10 gage)	4.80[1,9,15]		4.80[1,8]		4.80[4]	4.80[7]	5.50[44] 6.00[64]					4.80[3]	5.50[22]	
Enameling (12 gage)	4.65[1]		4.65[1,8]	4.65[4]		4.65[7]	4.65[6]						5.35[22]	
Long terne (10 gage)	5.20[9,15]		5.20[1]			5.20[7]	6.00[64]							
Hi str. low alloy, h.r.	5.40[1,5] 5.75[9]	5.40[1]	5.40[1,8] 5.90[6]	5.40[4,5]			5.40[1,4,13] 5.90[6]		5.40[3]	5.65[26]		5.40[3]		5.95[13]
Hi str. low alloy, c.r.	6.55[1,5] 6.90[9]		6.55[1,8] 7.05[6]	6.55[4,5]			6.55[4] 7.05[4]		6.55[3]			6.55[3]		7.10[13]
Hi str. low alloy, galv.	7.20[1]											6.75[3]		
STRIP Hot-rolled	3.60[9], 4.00[41,58], 3.75[28] 3.50[5,7]	3.50[66]	3.50[1,6,8]			3.50[7]	3.50[1,4,6] 4.00[13]		3.50[3,4]	3.90[26]	3.50[3]	3.50[3]		4.40[47] 3.80[12]
Cold-rolled	4.65[5,7,9] 5.00[28] 5.35[40,63]	4.90[8,66]	4.90[8]	4.65[2,5]		4.65[7]	4.65[4,6] 5.25[48,49] 5.35[13,40]		4.65[3]			4.65[3]		4.85[13] 5.45[47] 5.60[48,61]
Hi str. low alloy, h.r.	5.79[9]		5.50[1] 5.30[6,8,80]				4.95[4], 5.50[1] 5.40[13], 5.80[6] 6.20[4], 6.55[13] 7.05[6]		4.95[3]	5.55[26]		4.95[3]		5.95[13]
Hi str. low alloy, c.r.	7.20[9]			{6.55[2] 6.70[5]					6.40[3]			6.40[3]		
TINPLATE† Cokes, 1.25 lb base box (1.50 lb, add 25¢)	$8.45[1,5,9,15]		$8.45[1,6,8]				$8.45[4]					$8.55[3]		
Electrolytic 0.25, 0.50, 0.75 lb box	0.25 lb base box, $7.15[1,4,5,8,9]; $7.25[3,11]; $7.35[32] 0.50 lb, add 25¢; 0.75 lb add 65¢													
BLACKPLATE, 29 gage Hollowware enameling	5.85[1] 6.15[18]		5.85[1]				5.30[4]							
BARS Carbon steel	3.70[1,5] 3.85[9]	3.70[1,4,23]	3.70[1,4,6,8]	3.70[4]	3.70[4]		3.70[1,4,6]		3.70[3,4]		3.70[3]			3.85[21]
Reinforcing	3.70[1,5]	3.70[4]	3.70[1,6,8]	3.70[4]			3.70[1,4,6]		3.70[3,6]		3.70[3]	3.70[3]		
Cold-finished	4.55[2,4,5,52,69,71]	4.55[2,23,70]	4.55[4,74,73]	4.55[3]	4.55[4,62]		4.55[6,57]		4.60[70]					4.70[64] 4.90[106]
Alloy, hot-rolled	4.30[1,17]	4.30[1,4,23]	4.30[1,6,8]		4.30[4]		4.30[1,6]	4.30[6]	4.30[6,4]		4.30[3]			4.45[21] 4.65[13]
Alloy, cold-drawn	5.40[17,52,69,71,2]	5.40[4,23,69,70,73] 5.45[2]	5.40[4,73,74]		5.40[4,32]		5.40[6,25,57]	5.40[3]	5.40[3]					5.55[64] 5.60[106]
Hi str. low alloy, h.r.	5.55[1,5]		5.55[1,3] 6.05[6]	5.55[4,5]			5.55[1] 6.05[6]	5.55[3]	5.55[3]		5.55[3]			
PLATE Carbon steel	3.70[1,5,15] 4.00[9]	3.70[1,23]	3.70[1,6,8]	3.70[4,5]			3.70[1,4,6] 3.95[13]		3.70[3]	4.15[26]	3.70[3]	3.70[3]	4.40[22]	
Floor plates	4.75[1]	4.75[1]	4.75[8]	4.75[5]						4.75[26]				
Alloy	4.75[1]	4.75[1]	4.75[1]				5.20[13]			5.05[26]	4.75[3]	4.75[3]		
Hi str. low alloy	5.65[1,5]	5.65[1]	5.65[1,8] 6.15[6]	5.65[4,5]			{5.65[4] 5.70[13] 6.15[6]			5.90[26]	5.65[3]	5.65[3]		
SHAPES, Structural	3.65[1,5] 3.90[9]	3.65[1,23]	3.65[1,8]					3.70[3]	3.70[3]		3.70[3]			
Hi str. low alloy	5.50[1,5]	5.50[1]	5.50[1,8] 6.00[6]				6.00[6]	5.50[3]	5.50[3]		5.50[3]			
MANUFACTURERS' WIRE Bright	4.85[2,5] 5.10[18]	4.85[2] 4.33,34		4.85[2]			4.85[6]	Kokomo=4.95[30] 4.85[33]			4.85[3]	4.95[3]	Duluth=4.85[2]	
PILING, Steel Sheet	4.45[1]	4.45[1]	4.45[8]						4.45[3]					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
			F=$79.00[19]		INGOTS Carbon forging, net ton
	$82.00[83]		F=$80.00[19]		Alloy, net ton
		$56.00[11]	F=$75.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$74.00[83]	$66.00[11]	F=$85.00[19] SF, LS, S=$85.00[83]	Geneva=$66.00[16]	Carbon forging billets, net ton
	$78.00[83]		F=$89.00[19] LA=$90.00[82]		Alloy net ton
				Alton=4.40[32] Worcester=4.40[2] Minnequa=4.35[14] Portsmouth=4.30[39]	PIPE SKELP
	4.50[83]	4.10[4,11]	SF=4.90[2], F=4.90[19] LA=4.90[24,82]		WIRE RODS
		3.60[4,11]	SF, LA=4.30[24] F=4.55[19]	Niles=5.25[84], Geneva=3.70[16] Ashland=3.60[7]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.35[11]	SF=5.30[24] F=5.30[19]		Cold-rolled
		4.80[4,11]	SF, LA=5.55[24]	Ashland=4.80[7] Kokomo=5.20[30]	Galvanized (10 gage)
				Ashland=4.65[7]	Enameling (12 gage)
					Long ternes (10 gage)
		5.40[11]	F=6.35[19]		HI str. low alloy, h.r.
			F=7.50[19]		Hi str. low alloy, c.r.
					HI str. low alloy, galv.
4.10[83]	4.90[83]	3.50[4,11]	SF, LA=4.25[24,82] F=4.75[19], S=4.50[82]	Alton=3.95[32] Atlanta=4.05[65] Minnequa=4.55[14] Ashland=3.50[7]	STRIP Hot-rolled
			F=6.30[19] LA=6.40[27]	New Haven=5.15[3], 5.85[83] Trenton=6.00[45]	Cold-rolled
		5.30[11]	F=6.20[19] SF, LA=6.05[82] S=6.30[82]		HI str. low alloy, h.r.
			F=6.95[19]		HI str. low alloy, c.r.
		18.55[11]	SF=9.20[24]		TINPLATE Cokes, 1.25-lb base box (1.50 lb, add 25¢)
					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.30[83]	4.10[83]	3.70[4,11]	SF, LA=4.40[24]	Alton=4.15[32] Atlanta=4.25[65] Minnequa=4.15[14]	BARS Carbon stee
4.30[83]	4.10[83]	3.70[4,11]	SF, S=4.45[82] F=4.40[19], LA=4.40[82]	Atlanta=4.25[65] Minnequa=4.50[14]	Reinforcing
			LA=6.00[4]	Newark=5.00[69] Putnam=5.10[69] Hartford=5.10[4]	Cold-finished
4.90[83]	4.70[83]		LA=5.35[82] F=5.35[19]		Alloy, hot-rolled
				Newark=5.75[69] Worcester=5.75[2] Hartford=5.85[4]	Alloy, cold-drawn
		5.55[11]	F=6.60[19], SF, S=6.30[82] LA=6.25[82]	Claymont=4.15[29] Coatesville=4.15[21] Harrisburg=6.75[35]	HI str. low alloy, h.r.
	4.10[83]	3.70[4,11]	F=4.30[19] S=4.60[82]	Minnequa=4.50[14] Geneva=3.70[16]	PLATE Carbon steel
				Harrisburg=6.75[35]	Floor plates
			F=5.70[19]	Coatesville=5.25[21] Claymont=4.85[29]	Alloy
		5.65[11]	F=6.25[19] S=6.55[82]	Geneva=5.65[16]	HI str. low alloy
4.25[83]	4.05[83]	3.60[4] 3.65[11]	SF=4.20[82] F=4.25[19] LA=4.25[24,82] S=4.30[82]	Geneva 3.65[16] Minnequa 4.10[14] Phoenixville=6.25[56]	SHAPES, Structural
		5.50[11]	S=6.10[82] F=6.10[19] SF=6.00[82] LA=6.05[82]	Geneva=5.50[16]	SI str. low alloy
5.40[83]	5.25[83]	4.85[4,11]	SF, LA=5.80[24]	Alton=5.05[32] Atlanta=5.10[65] Worcester=5.15 Minnequa=5.10[14] Portsmouth=5.25[20]	MANUFACTURERS' WIRE Bright

† Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128-lb. deduct $2.20 from 1.25 lb coke base box.

Key to Steel Producers

1 U. S. Steel Co., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calstrip Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Claymont Steel Corp., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., Alton, Ill.
33 Northwestern Steel & Wire Co., Sterling, Ill
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling St. & Carbide, Mckeesport
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel, San Fran.
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wycoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit
85 Wickwire Spencer Steel, Buffalo
86 Angell Nail and Chaplet, Cleveland
87 Mid-States Steel & Wire, Crawfordsville Ind
88 National Supply, Pittsburgh, Pa.
89 Wheatland Tube Co., Wheatland, Pa.
90 Mercer Tube & Mfg. Co., Sharon, Pa.
91 Woodward Iron Co., Woodward, Ala.
92 Sloss-Sheffield Steel & Iron Co., Birmingham
93 Hanna Furnace Corp., Detroit
94 Interlake Iron Corp., Cleveland
95 Lone Star Steel Co., Dallas
96 Mystic Iron Works, Everett, Mass.
97 Jackson Iron & Steel Co., Jackson, O.
98 Globe Iron Co., Jackson, O.
99 Pittsburgh Coke & Chemical Co., Pittsburgh
100 Shenango Furnace Co., Pittsburgh
101 Tennessee Products & Chem. Corp., Nashville
102 Koppers Co., Inc., Granite City, Ill.
103 Page Steel & Wire Div., American Chain & Cable, Monessen, Pa.
104 Wallingford Steel Co., Wallingford, Conn.
105 Tonawanda Iron Div., N. Tonawanda, N. Y.
106 Pilgrim Drawn Steel Div., Automotive Materials Corp., Plymouth, Mich.

STAINLESS STEELS

Base price, cents per lb, f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs billets rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs die blocks rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars wires structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip hot-rolled	26.50	26.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip cold-rolled	34.00	36.75	40.25	38.75	59.00	46.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38 (type 316 add 4, 5¢), 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 45.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38 (type 316 add 4, 5¢); W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13 (type 301 add ¼¢); Butler, Pa., 7; Wallingford, Conn., 104.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28; Monessen, 103; Syracuse, N. Y., 17; Bridgeville, Pa., 59.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44; Syracuse, N. Y., 17.

Plates: Brackenridge, Pa., 28 (type 416 add ½¢); Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 17; Syracuse, 17; Ferndale, Mich., 28; Washington, Pa., 39.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1; Syracuse, N. Y., 17.

*ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 Series.

WASHINGTON STEEL—Slightly lower on 300 Series except where noted.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base Col.	Woven Wire Fence 9-15½ ga. Base Col.	Fence Posts Base Col.	Single Loop Bale Ties Base Col.	Twisted Barbless Wire Base Col.	Galv. Barbed Wire Base Col.	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv.(1) ¢/lb.
Alabama City-4	118	126	....	123	....	136	5.70	5.95
Aliquippa, Pa.-5	118	132	....	....	136	140	5.70	6.15
Atlanta-65	121	133	....	126	126	143	5.95	6.40
Bartonville-34	118	130	....	123	143	143	5.70	6.15
Buffalo-85	....	....	....	....	....	....	4.85	....
Cleveland-86	125	....	....	....	....	....	....	....
Cleveland-2	....	....	....	....	....	....	5.70	6.15
Crawfordsville-87	....	132	....	....	....	145	5.95	6.40
Donora, Pa.-2	118	130	....	123	140	140	5.70	6.15
Duluth-2	118	130	....	123	140	140	5.70	6.15
Fairfield, Ala.-11	118	130	....	123	....	140	5.70	6.15
Houston-83	126	138	....	....	....	148	6.10	6.55
Johnstown, Pa.-3	118	130	....	....	140	....	5.70	6.15
Joliet, Ill.-2	118	130	....	123	....	140	6.70	6.15
Kokomo, Ind.-30	120	132	....	125	138	142	5.80	6.05
Los Angeles-62	....	....	....	....	....	....	6.65	....
Kansas City-83	130	....	....	135	....	152	6.30	6.75
Minnequa-14	123	138	130	128	146	146	5.95	6.45
Monessen-18	124	135	....	....	....	145	5.95	6.40
Moline-Ill.-4	....	....	136	....	....	....	....	....
Pittsburg, Cal.-24	137	....	....	147	156	160	6.65	6.80
Portsmouth-20	124	137	....	....	147	147	6.10	6.60
Rankin, Pa.-2	118	130	....	....	140	140	5.70	6.15
So. Chicago, Ill.-4	118	126	140	123	....	136	5.70	5.95
S. San Fran.-14	....	....	....	147	....	160	6.65	7.10
Sparrows Pt.-3	120	....	....	125	142	142	5.80	6.25
Sterling, Ill.-33	118	130	....	123	140	140	5.70	6.15
Struthers, Ohio-6	....	....	....	....	....	....	6.70	6.15
Torrance, Cal.-24	138	....	....	....	....	....	6.65	....
Worcester-2	124	....	....	....	....	....	6.00	6.45
Williamsport, Pa.-51	....	....	150	....	....	....	....	....

Cut Nails, carloads, base, $7.35 per 100 lb (less 20¢ to jobbers), at Conshohocken, Pa., (26), Wheeling, W. Va. (15), $7.15.

(1) Alabama City and So. Chicago do not include zinc extra.

CAST IRON WATER PIPE

Per Net Ton

6 to 24-in., del'd Chicago $105.30 to $108.80
6 to 24-in., del'd N.Y.... 108.50 to 109.50
6 to 24-in., Birmingham 91.50 to 96.00
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less .....$123.00 to $130.00
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer-1	3.60	4.00	4.70	....	....	....	....	....
Chicago-4	....	....	....	6.15	....	....	....	....
Cleveland-3	....	....	....	....	....	9.35	....	....
Ensley-11	3.60	4.00	....	....	....	....	....	....
Fairfield-11	....	4.00	4.70	6.15	5.60	....	4.50	9.85
Gary-1	3.60	4.00	....	....	....	....	4.50	....
Ind. Harbor-8	3.60	....	4.70	6.15	5.60	....	4.50	....
Johnstown-3	....	4.00	....	....	5.60	....	....	....
Joliet-1	....	4.00	4.70	....	....	....	....	....
Kansas City-83	....	....	....	6.40	....	....	....	9.85
Lackawanna-3	3.60	4.00	4.70	....	....	....	4.50	....
Lebanon-3	....	....	....	6.15	....	9.35	....	9.85
Minnequa-14	3.60	4.50	4.70	6.15	....	....	4.50	9.85
Pittsburgh-3	....	....	....	....	....	9.35	....	....
Pittsburgh-77	....	....	....	....	....	9.35	....	9.85
Pittsburgh-78	....	....	....	....	....	....	....	9.85
Pittsburgh-5	....	....	....	6.15	....	....	....	....
Pittsburgh-24	....	....	....	....	....	....	4.65	....
Seattle-62	....	....	....	6.65	....	....	4.65	....
Steelton-3	3.60	....	4.70	....	....	....	4.50	....
Struthers-6	....	....	....	6.15	....	....	....	....
Torrance-24	....	....	....	....	....	....	4.65	....
Youngstown-4	....	....	....	6.15	....	....	....	....
Cleveland-4	....	....	....	....	....	9.35	....	....

BOILER TUBES

$ Per 100 ft. cut, 10 to 24 ft

F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	22.67	26.66	21.99	25.86
	2½	12	30.48	35.84	29.57	34.76
	3	12	33.90	39.90	32.88	38.70
	3½	11	42.37	49.86	41.10	48.38
	4	10	52.60	61.88	51.03	60.02
National Tube	2	13	21.62	26.48	....	....
	2½	12	29.65	36.32	....	....
	3	12	34.00	41.64	....	....
	3½	11	40.34	49.41	....	....
	4	10	51.21	62.72	....	....
Pittsburgh Steel	2	13	....	27.09	....	....
	2½	12	30.49	37.15	....	....
	3	12	34.95	42.59	....	....
	3½	11	41.48	50.54	....	....
	4	10	52.65	64.16	....	....

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill.
Price, net ton; Effective CaF_2 content:
70% or more $43.00
60% or less 40.00

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD ½ In. Blk.	½ In. Gal.	¾ In. Blk.	¾ In. Gal.	1 In. Blk.	1 In. Gal.	1¼ In. Blk.	1¼ In. Gal.	1½ In. Blk.	1½ In. Gal.	2 In. Blk.	2 In. Gal.	2½-3 In. Blk.	2½-3 In. Gal.	SEAMLESS 2 In. Blk.	2 In. Gal.	2½-3 In. Blk.	2½-3 In. Gal.	3½-4 In. Blk.	3½-4 In. Gal.
STANDARD T. & C.																				
Sparrows Pt.-3	34.0	12.0	37.0	16.0	39.5	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0	....	....	....	....	....	....
Cleveland-4	36.0	14.0	39.0	18.0	41.5	21.5	42.9	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Oakland-19	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0	....	....	....	....	....	....
Pittsburgh-5	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5
Pittsburgh-10	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
Alton, Ill.-32	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0	....	....	....	....	....	....
Sharon-90	36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0	....	....	....	....	....	....
Pittsburgh-88	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	....	32.5	....	34.5	....
Wheeling-15	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	....	....	....	....	....	....
Wheatland-89	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown-6	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
EXTRA STRONG, PLAIN ENDS																				
Sparrows Pt.-3	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0	....	....	....	....	....	....
Cleveland-4	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Oakland-19	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0	....	....	....	....	....	....
Pittsburgh-5	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.5	15.5
Pittsburgh-10	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5
Alton, Ill.-32	32.5	12.0	36.5	16.0	38.5	19.5	39.0	20.0	39.5	21.0	40.0	21.5	40.5	22.0	....	....	....	....	....	....
Sharon-90	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0	....	....	....	....	....	....
Pittsburgh-88	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	....	33.0	....	36.5	....
Wheeling-15	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	....	....	....	....	....	....
Wheatland-89	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	....	....	....	....	....	....
Youngstown-6	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	26.0	29.0	10.0	33.0	14.0	36.5	17.5

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.

Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct. East St. Louis zinc price now 19.50¢.

Miscellaneous Prices

WAREHOUSES

Base price, f.o.b., dollars per 100 lb. *(Metropolitan area delivery add 20¢ except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Philadelphia, add 25¢; New York, add 30¢.)

Cities	Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed
Baltimore	5.60	6.84	7.48[2]–8.07	6.04	.....	5.80	6.14	6.04	6.84–6.89	10.24	10.54	11.89	12.19
Birmingham*	5.60	6.40	6.75	5.55	.....	5.95	5.70	5.55	.....	.....	.....	.....	.....
Boston	6.20	7.00–7.25	7.74–8.29	6.15	8.50[4]	6.48–6.78	6.20	6.05	6.79–6.84	10.25	10.55	11.90–12.00	12.20–12.30
Buffalo	5.60	6.40	7.74–8.09	5.86	.....	6.05	5.80	5.60	6.40–6.45	10.15–10.85	10.45	11.80	11.95–12.10
Chicago	5.60	6.40	7.75	5.55	.....	5.80	5.70	5.55	6.30	9.80	10.10	11.45	11.75
Cincinnati*	5.67	6.44	7.39	.80	.....	6.19	6.09	5.80	6.61	10.15	10.45	11.80	12.10
Cleveland	5.60	6.40	8.10	5.69	6.90	5.92	5.82	5.57	6.40	9.91	10.21	11.56	11.86
Detroit	5.78	6.53	7.69	5.94	.....	5.99	6.09	5.84	6.56	10.11	10.41	11.76	12.06
Houston	7.00	8.25	.....	.....	.....	6.85	6.50	6.65	9.35	10.35	11.25	.....	12.75
Indianapolis, del'd	6.00	6.80	8.15	5.95	.....	6.20	6.10	5.95	6.80	.....	.....	.....	.....
Kansas City	6.00	6.60	7.45	6.15	7.50	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.35
Los Angeles	6.35	7.90	8.85	6.40	9.45[6]	6.40	6.35	6.35	8.20	11.30	11.30	13.20	13.50
Memphis*	6.33	7.08	.....	6.33	.....	6.43	6.33	6.08	7.16	.....	.....	.....	.....
Milwaukee	6.38	7.18	7.89	6.38	.....	6.02	6.48	6.33	7.32	.....	.....	.....	.....
New Orleans*	5.74	6.54	7.89	5.69–6.69	.....	5.94	5.84	5.69	6.44–6.54	9.94	10.24	11.59	11.89
New York*	5.70	6.59	.....	5.75	7.25	5.95	5.75	5.75	7.30	.....	.....	.....	.....
	5.67–5.97	7.19[5]–7.24[1]	8.14[2]	6.29–6.89	8.63[4]	6.28–6.58	6.10	6.12	6.99	10.05–10.15	10.35–10.45	11.70–11.80	12.10–12.20
Norfolk	6.50[3]	.....	.....	.....	.....	6.50[3]	6.60[3]	6.55[3]	.....	.....	.....	.....	.....
Philadelphia*	5.90	6.80	8.00	6.10	.....	6.05	5.90	6.05	6.86	9.90	10.20	.....	.....
Pittsburgh	5.60	6.40	7.75	5.65–5.95	.....	5.75	5.70	5.55	6.15	9.80	10.10	11.45	11.75
Portland	6.60–7.55	8.95	8.50–9.10	7.30	.....	6.80	6.95	6.90	.....	.....	12.15	.....	.....
Salt Lake City	7.95	.....	9.70–10.50[2]	8.70–8.75	.....	8.05	6.75–8.30	7.95–8.65	9.00	.....	.....	.....	.....
San Francisco*	6.65	8.05[2]	8.55–8.90[2]	6.60	9.95[6]	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.20–13.50
Seattle	7.05	8.60	9.20	9.05	.....	6.75	6.65	6.75	9.05	.....	.....	.....	.....
St. Louis	5.80–5.85	6.85	8.00	5.80	8.00[4]–8.28	6.13	6.03	5.80	6.55–6.65	10.05	10.35	11.70	12.00
St. Paul*	6.16	6.96	8.31	6.11	.....	6.38	6.26	6.11	6.96	10.36	10.66	12.01	12.31

BASE QUANTITIES (Standard unless otherwise, keyed): Cold finished bars; 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanizing sheets, for quantity.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 6000 lb and over; (5) 1500 to 9999 lb; (6) 2000 to 5999 lb.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Blast Furnace Silvery	Low Phos. Charcoal
Bethlehem-3	54.00	54.50	55.00	55.50	.....	.....	.....
Birmingham-4	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-91	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-92	48.38	48.88	.....	.....	.....	.....	.....
Buffalo-4	52.00	52.50	53.00	.....	.....	.....	.....
Buffalo-93	52.00	52.50	53.00	.....	.....	63.75	.....
Chicago-94	52.00	52.50	52.50	53.00	.....	.....	.....
Cleveland-2	52.00	52.50	52.50	53.00	57.00	.....	.....
Cleveland-4	52.00	52.50	52.50	.....	.....	.....	.....
Daingerfield, Tex.-95	48.00	48.50	48.50	.....	.....	.....	.....
Duluth-94	52.00	52.50	52.50	53.00	.....	.....	.....
Erie-94	52.00	52.50	52.50	53.00	.....	.....	.....
Everett, Mass.-96	.....	57.00	57.50	.....	.....	.....	.....
Fontana-19	58.00	58.50	.....	.....	.....	.....	.....
Geneva, Utah-16	52.00	52.50	52.50	53.00	.....	.....	.....
Granite City, Ill.-102	53.90	54.40	54.90	.....	.....	.....	.....
Hubbard, Ohio-6	52.00	52.50	52.50	.....	.....	.....	.....
Ironton, Utah-16	52.00	52.50	.....	.....	.....	.....	.....
Jackson, Ohio-97, 98	.....	.....	.....	.....	.....	62.50	.....
Lyle, Tenn.-101	.....	.....	.....	.....	.....	.....	66.00
Monessen-16	54.00	.....	.....	.....	.....	.....	.....
Neville Island-90	52.00	52.50	52.50	53.00	.....	.....	.....
Pittsburgh-1	52.00	.....	.....	53.00	.....	.....	.....
Sharpsville-100	52.00	52.50	52.50	53.00	.....	.....	.....
Steelton-3	54.00	54.50	55.00	55.50	60.00	.....	.....
Swedeland-26	56.00	56.50	57.00	57.50	.....	.....	.....
Toledo-94	52.00	52.50	52.50	53.00	.....	.....	.....
Troy, N. Y.-4	54.00	54.50	55.00	.....	60.00	.....	.....
Youngstown-6	52.00	52.50	52.50	53.00	.....	.....	.....
N. Tonawanda, N. Y.-105	.....	52.50	53.00	.....	.....	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base.(1.75 to 2.25 pct, except low phos..1.75 to 2.00 pct), 50¢ per ton for each 0.50, pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 25¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

REFRACTORIES

Fire Clay Brick

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	88.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick — *Per Net Ton*

Standard chemically bonded, Balt., Chester	$82.00

Magnesite Brick

Standard, Baltimore	$104.00
Chemically bonded, Baltimore	93.00

Grain Magnesite — *St. %-in. grains*

Domestic, f.o.b. Baltimore, in bulk fines removed	$62.70
Domestic, f.o.b. Chewelah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ $13.75

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$17.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$26.69
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00

LAKE SUPERIOR ORES

(51.50% *Fe; natural content, delivered lower lake ports*) — *Per gross ton*

Old range, bessemer	$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

C-R SPRING STEEL

F.o.b. Mill Cents Per Lb.	CARBON CONTENT				
	0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn.-58	5.35	6.80	7.40	9.35	11.65
Carnegie, Pa.-41	.....	6.80	7.40	9.35	11.65
Cleveland-2	4.65	6.45	7.40	9.35	11.65
Detroit-68	5.60	6.65	7.25	.....	.....
New Castle, Pa.-40	5.35	6.80	7.40	9.35	.....
New Haven, Conn.-68	5.85	6.75	7.35	.....	.....
Sharon, Pa.-13	5.35	6.80	7.40	9.35	11.65
Weirton, W. Va.-9	5.35	6.80	7.40	9.35	11.65
Worcester, Mass.-2	4.95	6.75	7.70	9.65	11.65
Youngstown-48	.....	6.80	7.40	9.35	11.65

Miscellaneous Prices

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in...	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

Nuts, Hot Pressed, Cold Punched—Sq

	Pct Off List Less Keg Reg.	K. Reg.	Less Keg Hvy.	K. Hvy.
½ in. & smaller.	15	28½	15	28½
9/16 in. & ⅝ in.	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger.	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller.	26	37	22	34
9/16 in. & ⅝ in.	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller.	26	37	22	34
9/16 in. & ⅝ in.	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	12	25
1⅝ in. & larger.	12	25	6½	21

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller.	35	45	28½	39½
9/16 in. & ⅝ in.	29½	40½	22	34
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger.	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thru ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts — *Pct Off List*

Packaged, steel, plain finished.	48—10
Packaged, plated finish	31—10
Bulk, plain finish**	62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets — *Base per 100 lb.*

½ in. & larger	$7.85
	Pct Off List
7/16 in. & smaller	36

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.

Cap and Set Screws

(In bulk)	Pct Off List
Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
¾ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
¾ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter	53

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

ELECTRODES

Cents per lb., f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

CLAD STEEL

Base prices, cents per pound, f.o.b., mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. (21)	*29.5	
Washgtn., Pa. (39)	*29.5	
Claymont, Del. (29)	*28.00	
Conshohocken, Pa. (26)		*27.50
New Castle, Ind. (55)	*26.50	*25.50
Nickel-carbon		
10 pct Coatesville (21)	32.5	
Inconel-carbon		
10 pct Coatesville (21)	40.5	
Monel-carbon		
10 pct Coatesville (21)	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. (60)		77.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$2.13
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	81.0¢
6	4	2	6	—	96.5¢
High-carbon chromium					63.5¢
Oil hardened manganese					35¢
Special carbon					32.5¢
Extra carbon					27¢
Regular carbon					23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, In East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe	42.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe.	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.75¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd.	$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	83.00¢
Stainless steel, 316	$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢

ELECTRICAL SHEETS

22 Ga. H-R cut lengths

F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech-Bottom-15	....	7.25	8.50	9.30	9.85	10.40	11.10
Brackenridge-28	....	7.25	8.50	9.30	9.85	....	....
Follansbee-23	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Granite City-22	....	7.95	9.20	....	....	....	....
Ind. Harbor-3	6.75	7.25	....	....	....	....	....
Mansfield-75	7.25	7.75	9.00	9.80	....	....	....
Niles, O.-64	7.05	7.55	....	....	....	....	....
Vandergrift-1	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O-4	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville-7	6.75	7.25	8.50	9.30	9.85	10.40	11.10

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50
0.10% C	30.00
0.15% C	29.75
0.20% C	29.50
0.50% C	29.35
1.00% C	29.00
2.00% C	28.75
65-69% Cr, 4-9% C	22.00
62-66% Cr, 4-6% C, 6-9% Si	22.60

Foundry Ferrochrome

Contract prices, cents per lb of alloy. Noncontract prices add 0.25¢ per lb.

High carbon 8 mesh and down.

62 to 66% Cr, 5 to 7% C, 7 to 10% Si.

Carloads, bulk	23.35
Carloads, packed	24.15
Ton lots, packed	27.35

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.10% max. C.	$1.14
0.50% max. C.	1.10
9 to 11% C.	1.04

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50¢
Less ton lots	17.75¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

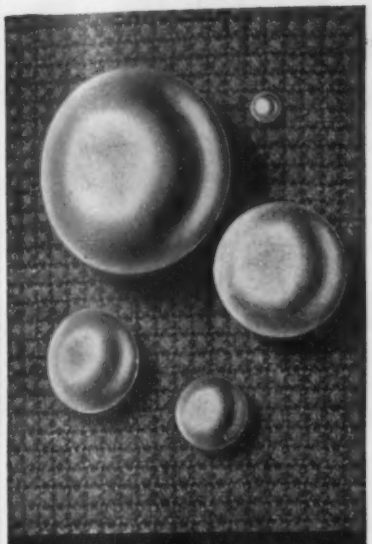
Carload packed	18.00¢
Ton lots to carload packed	19.00¢
Less ton lots	20.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ⅛ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

a metal ball PROBLEM?



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—Ferroalloy Prices—

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O.	$185
F.o.b. Johnstown, Pa.	$187
F.o.b. Sheridan, Pa.	$185
F.o.b. Etna, Clairton, Pa.	$188

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.95
Ton lots	12.55

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pgh. or Chicago	75.00	76.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	34.75
Ton lots	36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn.....19.15¢

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carload, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90-95% Si			17.50

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C, 7.00% max. Si	21.25	23.10	24.30

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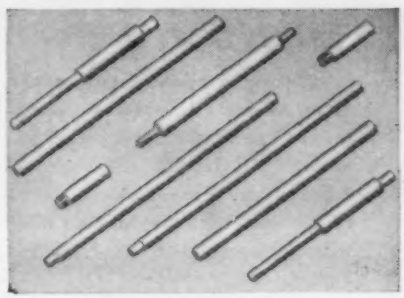

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—Ferroalloy Prices—

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	9.90¢
Ton lots	11.30¢
Calcium molybdate, 46.3-46.6%, f.o.b. Langeloth, Pa., per pound contained Mo.	$1.15
Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.	
Ton lots	$4.90
Less ton lots	4.95
Ferro - Tantalum - columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	$3.75
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	$1.32
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	$1.35
Ferrotitanium, 25%, low carbon, 0.10% C max. f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa. freight allowed, ton lots, per lb contained Ti	$1.50
Less ton lots	1.55
Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y. freight allowed, carload per net ton	$177.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	$5.00
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa.	$1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa.	$1.13
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk lump	14.50¢
Ton lots, bulk lump	15.75¢
Less ton lots, lump	16.25¢
Vanadium pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5	$1.28
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15% contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	7.00¢
Boron Agents	
Contract prices per lb of alloy, del. Borosil, f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B	$5.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Corbortam, Ti, 15-21% B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	$1.20
Fo.b. Wash., Pa.; 100 lb up	
10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	$1.00
No. 6	68¢
No. 79	50¢
Manganese—Boron 75.00% Mn. 15-20% B 5% max. Fe. 1.50% max. Si. 3.00% max. C, 2 in. x D, del'd	
Ton lots	$1.46
Less ton lots	1.57
Nickel—Boron 15-18% B. 1.00% max. Al. 1.50% max. Si. 0.50% max. C. 3.00% max. Fe, balance Ni delivered.	
Less ton lots	$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00¢

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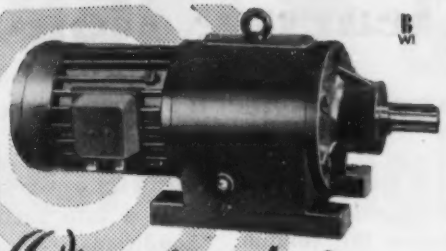

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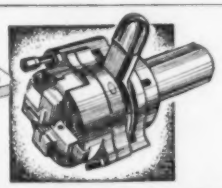

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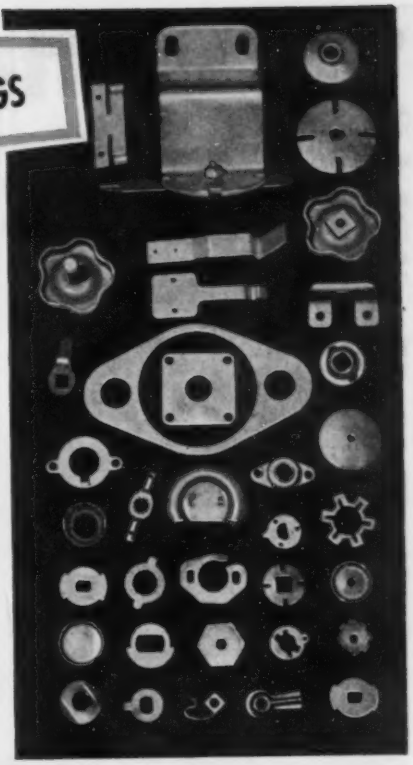

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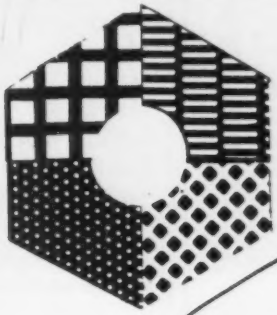

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NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Several factors have tended to hold used machinery sales in Detroit somewhat below the volume that might be expected. They are: (1) Desirable equipment is still relatively scarce, (2) many plants have found ways to adapt available equipment to defense jobs and have bypassed the used market, and (3) subcontracting programs, although gaining some momentum, continue slow despite general opinion elsewhere that Detroit is jammed with war work.

Currently, some used machinery firms in Detroit are experiencing a slight year-end pause in buying. This deficiency in the market can hardly be called a slump but it can definitely be labeled a period of hesitation.

High City Tax—A factor to be reckoned with always in Detroit is the city tax which amounts to a whopping $50 per $1000. Because of heavy taxation, the tendency here has always been for dealers to reduce their inventories to the lowest possible level in December.

But ability to sell has been hampered by slowness of defense programs and general sales resistance of Detroit buyers. Good late machines will still go anywhere anytime.

Manpower—Skilled manpower constitutes a serious problem in the Detroit area used machinery trade. Some parts shortages have struck. Bearings are often difficult to locate. Trade opinion here, however, seems to be that the many reports of acute manpower and materials problems appear to be exaggerated.

Although it is definitely known that a number of top toolmakers have been lured away from the district by higher salaries, the number of men out to make hay while the sun shines thus far is comparatively small.

Dealers also report that they are able, with some difficulty and delay, to line up the essential parts they need to bring their machines into satisfactory working conditions.

Pittsburgh Market—Steel plant expansion is reflected in demand for cranes in the Pittsburgh used equipment market. Two mills, one in the Pittsburgh district and the other in Delaware, are circulating inquiries for 75-ton ladle cranes. Rolling mills are asking for lighter crane equipment.

A Pittsburgh broker reported plenty of inquiries but hardly any equipment available. In many cases, the customer will accept a crane not exactly suited to his requirements and revamp it. Demand for 3- and 5-ton floor-controlled cranes, often a drug on the market, is particularly strong.

Hard to Get—Unavailability of new electrical equipment has affected producers of this equipment as well as their customers in Pittsburgh. One dealer reported that a leading electrical equipment producer recently bought $10,000 to $15,000 worth of material from him for its own requirements. Transformers and motor generator sets are hard to come by.

Demand High—Stocks of desirable used machine tools are low, inquiries high in Pittsburgh. The result is that November was a slow month for some dealers. Some equipment is being immobilized due to price controls. For example, an available bending roll carries a ceiling price of $600. Actual market value is $1500.

The owner is asking the dealer for the ceiling price of $600, which would leave the dealer no margin of profit. Consequently, unless the owner takes the trouble of marketing the machine direct, it will sit there.

On the other hand, some ceiling prices appear to be more than liberal. Ceiling on a 30-year-old 24-in. lathe, for instance, is $6000. Market value is $600.

MAYARI R adds strength to electric freight locomotives

In building six new type A-C freight-locomotive units, General Electric used Mayari R for some of the structural members in the platforms. For instance, the transverse members or bolsters located between the main underframe channels, and the draft-gear housing between the main channels at the end of each platform, are made from this low-alloy, high-strength steel. Mayari R was used because it provided the higher strength needed without increasing the deadweight beyond the specified limits. In other words, it added strength without adding excess weight.

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Full information on the applications of Mayari R is readily available. Write for Catalog 259.

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